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**PRIMITIVE CARRIERS IN LAND
TRANSPORTATION¹**

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The Egyptian obelisk which adorns Central Park, New York, is one of the few objects that represent in their history phases of both ancient and modern methods of transportation. Hewn from the syenite of Assuan, it was transported over 600 miles to the present Alexandria, where it stood for many centuries. No one knows how many years, how many thousands of men were spent in the slow, tremendous labor of dragging the huge monolith from Upper Egypt to the edge of the Mediterranean.

Then came a time when it was loaded in the hold of a steamship and in a brief period was transferred by water and up through Manhattan Island to its present place. Mechanical science made this final journey, fraught with some difficulty, to be sure, a mere bagatelle as compared with its first removal many ages ago.

The old and the new still jostle one another in our land. The "prairie schooner" has not quite passed into history. It has often been seen this year entering our western mountains, carrying the family gods to better lands, perhaps to some fertile valley in Montana where the cattle, trailing behind it, may find richer grazing. Meanwhile a man, traveling on the second fastest train between

¹ The author wishes to acknowledge his indebtedness to the United States National Museum, the Smithsonian Institution, the Bureau of Good Roads and the Congressional Library of Washington, D. C.; and especially to thank Mr. W. C. Wheeler of the U. S. Geological Survey for his kind assistance.

The illustrations of this paper are from photographs of models exhibited in the National Museum at Washington except Fig. 2, which we owe to the courtesy of Professor Hiram Bingham of Yale University.

Chicago and New York, writes that he sat down to breakfast with the Catskills still in view and when he adjourned to the smoking car he was abreast of Newburg.

The writer will endeavor to show in this paper the steps by which land transportation, propelled only by the muscular strength of men and animals, has advanced to its present position.

In the lowest stages of human culture the method of transportation is correspondingly primitive. Man, himself, is the means of traffic and transportation. A higher stage in the development of culture comes in with the breeding of animals. Social life is then more complex. The family is no longer the only unit. Then is developed the idea of the tribe, which among many hunting and fishing people had such an indefinite meaning that we cannot ascribe any importance to it. The tribe was the result of the union of several families brought together by the need of strength and power. Tribal peoples respected the right of private ownership. The men grouped themselves for the purpose of protection. Animals represented their most valuable property and the increase of herds created the nomadic life. Having exhausted one pasturage, they were forced to look for another, and so families with all their property were transferred to other scenes. Transportation became more advanced among these people and they learned to use animals as beasts of burden because they had heavier loads to transport than before. Later they used vehicles, and other means of easy transportation.

The next important step in human culture was the development of agriculture, which was accompanied by the fixed settlement of peoples on lands adapted for their need. By cultivating their arable land, they were able to supply themselves and their herds with food and thus surmounted the need of wandering. This is the period in the history of mankind, when the supply of produce exceeded the family demand and man began to turn the surplus to account by exchanging crops and cattle for other commodities. Thus among some peoples the germ of commerce was in agriculture.

Primitive industry was especially to be noted among fishing and hunting peoples; but the highest degree of human culture brings with it the development of advanced industry. Commerce is one of the results of this later age, but the fruits and products of the human mind, the inventions and the sciences, are the most precious possessions. Transportation, as the facts here given show, is an important consideration in discussing the growth of culture, because it im-

proves with human development. It is a dial by which we may measure the advance of civilization.

Transportation as Influenced by Environment. Land transportation is different from water, and this again from aerial transportation. Environment is in every case the determining factor. Aerial transportation is the most difficult, as well as the hardest to perfect. The problem in the solution of this question is to overcome gravity. The most recent triumph of modern technic has solved this question by producing bodies of large surface and light weight (aeroplane and airship). Transportation on rivers and lakes and along the seashore was practiced in the very early ages of mankind. Ocean crossing claims more advanced methods and a more advanced stage of human civilization. In this paper, water transport will not be treated in detail, as land transportation is especially in view.

Morphology and Land Transportation. In the discussion of land transportation, some reference will be made to the morphological character of regions. The method of transportation and the morphological character of a region are so closely related that we are able often to name the morphology of a region even from a simple reference to its method of transportation; and *vice versa* the morphology of a region suggests its methods of transportation. When a desert is mentioned we know at once that animal power is the method of transportation, and we also know that it is represented by the camel or its equivalent; and if we mention the camel, a desert is the morphological region at once brought to mind.

In our further discussion, there will be some occasion to speak of the different morphological regions. The following classification will be used:

1. Sandy and gravelly shores (sea- and lake-shores);
2. Plains (lowlands and plateaus);
3. Hilly lands (sand dune regions included);
4. Mountains of moderate height;
5. High mountains;
6. Deserts;
7. Virgin forests.

The last two terms in this classification may seem questionable, since there are lowlands, plateaus and hilly lands, which may also be deserts or virgin forests; but because the notion of desert is connected with a particularly dry, and that of the virgin forest with an extremely wet climate, we may distinguish these two morphological regions from those above mentioned, in order to secure for them an independent position in our system. In nature the distinction is not so sharp between these morphological regions as it appears to be in our classification. Even the transitions in morphological regions are so gradual that the strict classification of a cer-

tain country is often difficult. This appears in the case of the broad beach of a sandy shore, which extends out into the zones of the front dunes (fore dunes) and still farther inland into the dune ranges of a different kind, all of which run nearly parallel to the shore line. We encounter the same uncertainty in the transition of hilly lands into regions of high mountains.

In discussing the different methods of land transportation, I wish to call attention to the classifications of Prof. Charles H. Cooley² and that of Prof. Hermann Wagner.³ Cooley distinguishes four kinds of transportation methods:

1. Human burden-bearer; 2. Animal burden-carrier; 3. Vehicle (man and animal in traction); 4. Modern machines.

The classification of Professor Wagner differs from that of Cooley in the first, second and last headings only in the terms used. The third heading is divided into two parts, the sled and the wheel vehicle. We shall neither follow the classification of Cooley nor that of Wagner, but shall use one which is a combination of the two, but much simplified.

Land Transportation Carriers. To carry on transportation, it became necessary to construct vehicles and to vary them according to the obstacles met. Primitive means of transportation overcame only a few obstacles. Only at a later stage did the obstacles disappear one by one and increased rapidity of motion became noticeable. As ideas grew and methods of construction improved, less time was consumed in making the same distance; and now we have the contrast between the sled and the automobile. In every case the development of the carriers reflects the degree of culture of the people and of the age; hence the description of each type of carrier reflects the cultural history of its time.

The most primitive carriers are those which are based purely upon muscular power. Man and animal are the carriers. At first the human being bore the burden (Fig. 1), especially the women, whose subordinate position explains the fact. Later on we find the men among the burden bearers. Some carried loads upon their heads, others upon their shoulders, still others upon their backs. According to Herodotus the women of Egypt carried loads upon their shoulders and men carried loads upon their heads. The Indians used a burden strap, which "was commonly worn around the forehead and lashed

² C. H. Cooley, *The Theory of Transportation, Publications of the American Economic Association*, Vol. 2, 1894, pp. 30-30, Baltimore.

³ Hermann Wagner, *Lehrbuch der Geographie*. 9. Aufl., Hannover und Leipzig, 1912, pp. 900-913.



FIG. 1--Human burden-bearer (Korean).

to a litter borne on the back."⁴ This manner of burden-bearing dates back to prehistoric times, but it survives even to-day. Among many of the inhabitants of Africa, Polynesia, Madagascar, Borneo, Celebes and some other regions this is still the only means of land transportation. It has survived even in modern countries, especially in mountainous districts, and among such wandering folk as the Slovaks of North Hungary, who make a livelihood by repairing windows and kitchen furniture; also among wandering Bosnians and Herzegovinians, who traffic in different wares and carry their "shop," which is a basket, upon their shoulders or heads. In rare instances we find this most primitive method of transportation even in civilized centers, where it is used for carrying burdens short distances, especially in the transportation of passengers in chairs, in Japan and China.

Animals take the place of man for carrying heavier burdens. Various animals have been used for this purpose in different ages and regions. The ass,⁵ horse, mule, ox, yak, water buffalo (the so-called Indian buffalo and the Cape buffalo), zebu, llama, camel, elephant and ostrich are the most common. Single animals carry loads upon their backs (in basket, box, sack, etc.). Laden horses, camels, and other animals were driven in tandem in the fourteenth century, in Algeria, Persia, Morocco, China and France. Figs. 2, 3 and 4 illustrate some of these burden-bearing animals. Their use goes back to the oldest historical times and in regions without distinct roads, as among high mountains, deserts and virgin forests, where they are still the only means of transport. The horse and ox are cosmopolites, but the ass and mule are chiefly found in southern regions. The yak is a burden bearer in Tibet, the water buffalo in southeast Asia, and the zebu in India. The camel is used mostly in the deserts of Asia and Africa, the elephant in the forest regions of India and Africa, and the llama in western South America.

Vehicle Carriers. Man thought of constructing vehicles only when he wished to transport loads too heavy to be carried upon the backs of man or animal. He found the employment of vehicles both expedient and economical. One man or animal could thus transport a much heavier load. With these carriers came, in time, the necessity of making artificial roads, especially in rough country; but

⁴ J. L. Ringwalt, *Development of Transportation Systems in the United States. Railway World*, Philadelphia, 1888.

⁵ The ass was domesticated probably before the horse. Marshall M. Kirkman, *Classical Portfolio of Primitive Carriers*, The World Railway Publishing Co., Chicago, 1895.



FIG. 2.



FIG. 3.

FIG. 2—Group of llamas in Peru.
FIG. 3—Arabian camel.

roads came later and with the improvement of vehicles. At first the roads were merely the paths or trails of man or animals.

Vehicle carriers are driven either by muscular power or machinery. The muscular power is supplied by man and animals. Besides the animals mentioned above, there are also used for traction, reindeer (in the extreme northern regions), dogs (in Germany, Belgium, Austria, Holland), pigs (in Austria-Hungary), and goats (in Austria, Germany, Switzerland, and other countries), for drawing children's wagons. The germ of muscular power carriers is to be seen in the *travois* of the Indians. They fastened one end of the poles of their tent to the sides of their horse, and let the other ends free to drag. Upon these were placed the tent, skins, other baggage, and even the children and women. They transported their food and hunting spoils in a similar way. This contrivance was simple, yet it had great importance in the history of civilization.

The next step came in the use of rollers (Fig. 5) for transporting heavy building stones. This carrier had not yet a definite form. Two or three rollers were placed crosswise upon narrow planks, and upon these the stone. This device is still used. It is not economical in point of time, since it can be drawn only about the length of the stone⁶ before readjusting the rollers.

Carriers with definite forms were a great improvement. To these belong the sliding and wheeled carriers of muscular-power vehicles and machine vehicles. The first vehicle with definite form showed only slight evidence of man's handiwork. The Indians of North America took a forked limb of a tree, placed three smaller pieces of a limb across it, and in this way the first type of the sledge was made. After a time, when they had to carry heavy loads, they were not satisfied with this simple carrier, by which the load was raised only a little above the surface of the ground. They invented the built-up sled which decreased the friction and increased the speed. This was in many countries the first carrier in which the whole vehicle was high and the load did not come in contact with the ground. The sled is not necessarily the product of snowy mountain regions, because it is in use elsewhere. The Egyptians used it to transfer building-stones,⁷ and it is in use even at the present time in Madeira and on the Canary Islands, where snow never falls. In Asheville, North Carolina, and in many other places in the United States, we find this contrivance, its use being re-

⁶ This form is extensively used in moving many large objects, as houses.

⁷ O. T. Mason, *Primitive Travel and Transportation*. *Ann. Report of the U. S. National Museum for 1893-94*, pp. 330-593; reference on p. 545. Washington, 1893.

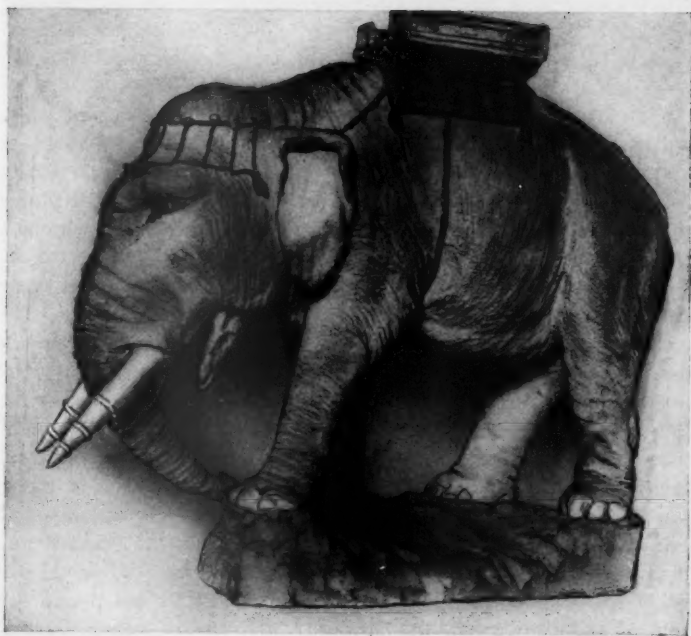


FIG. 4.



FIG. 5.

FIG. 4—Indian elephant.

FIG. 5—Use of rollers for transporting heavy building stones.

stricted to even or not very rough land surfaces, such as a meadow, or a very steep hillside. Modern sledges were developed from the built-up sled type, and differ from it mostly in the additional upper part, which may be a basket or body.

The use of springs soon followed, the great importance of which will be noted later. The canoe-shaped carrier drawn by two oxen and used in Syria is also to be mentioned. The boat-sled often used by Arctic explorers, is both a sled and a boat. It is a boat placed upon a sled. Another combination is made by attaching wheels to the boat-sled, as in the burial carriage used by the Egyptians. To this group also belong the snow shoes used by North American Indians, the ski of Scandinavia and the skate of to-day.

The friction was too great among the sliding vehicles. It was desirable to decrease it. This question of decreasing the friction was solved by the transitional type of muscular-power vehicles, as the Egyptian rolling sled (Fig. 6), which was carried on rollers placed below the sled runners. These rollers not only decreased the friction, but also added to the speed of the vehicle. The transportation of marble columns in Greece was facilitated by encasing the column in a wooden frame (Fig. 7), to reduce the friction and increase the speed. Its special disadvantage was the danger of damage to the enclosed marble. Of the same type are the barrel-vehicles, the tobacco-rolling hogshead and the rolling tar barrel (Fig. 8) used in Virginia and in North Carolina until the middle of the last century. More advanced is the cylindrical framework of the Greeks, to transport marble prisms (Fig. 9). Its purpose was the protection of the object in transportation and the increase of speed. The most improved type of the transitional muscular-power carriers is the Nantucket fish cart represented in Fig. 10. The barrel in front of the box serves for a wheel, and is not a direct carrier itself. Its use is restricted to the sandy seashore. Narrow wheeled vehicles run with much difficulty in sandy soil, and this fact explains the use of this primitive vehicle in our time.

We cannot fix the date of the first appearance of wheeled vehicles. We know, however, that some 5,700 years ago Sharrukin, King of Agada, Mesopotamia, made his invasion to the Mediterranean in chariots. The Chaldeans, Assyrians, Phoenicians, Persians, Greeks, Romans, and other peoples of ancient and mediæval time used wheeled vehicles. There were many styles of these carriers. They seem first to have been used for carrying heavy articles, and so the wheels were made solid and massive. Natives of Central America



FIG. 8.

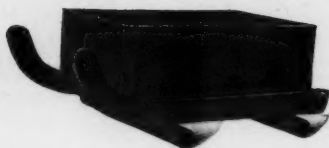


FIG. 6.

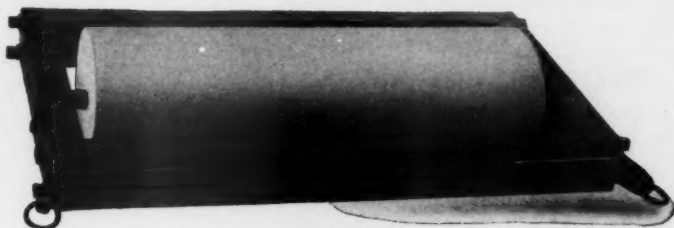


FIG. 7.

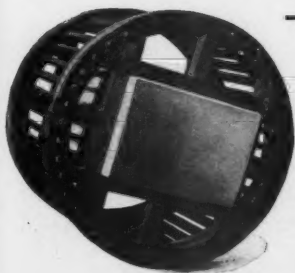


FIG. 9.



FIG. 11.

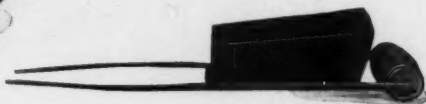


FIG. 10.

FIG. 6—Egyptian rolling sled.

FIG. 7—Wooden frame used by the Greeks to transport marble columns.

FIG. 8—Types of barrel-vehicles (tobacco-rolling hogshead and rolling tar barrel) used in Virginia and North Carolina up to 1850.

FIG. 9—Cylindrical framework used by the Greeks to transport marble prisms.

FIG. 10—Nantucket fish cart.

FIG. 11—Greek *scytala*.

fastened two solid wheels under a plank with a donkey as motive power. The solid wheels were entirely of wood, cut from a tree trunk. That vehicles with four wheels were of later date is an historical and a logical fact. Two-wheeled vehicles were easier to construct, more capable of withstanding hard usage on an uneven, rugged surface. The next step from the Central American cart leads us to Aristotle's *scytala* (Fig. 11). Its four wheels marked a more advanced stage in wagon making and the running gear was somewhat improved. The axle and wheels were of one piece, and the axle was attached to the bottom of the body by leather straps.

More advanced still is the Russian Bashkir child's coach (Fig. 12). The solid wheels revolve here upon the axle and the body of the vehicle is attached to the running gear by straps. Next came the Roman oil and wine cart and the Roman farm *plaustrum* (wagon) (Fig. 13). From one to four strips of wood are nailed across the solid wheel, apparently to strengthen it. The construction of the running gear is not very complete and may perhaps place it among the two preceding types. The body is a basket, set upon the running gear. The historical and geographical distribution of these vehicles is extensive. We meet them not only among the ancient nations, but also to-day in Siam and Burma, the British Isles, Ceylon, India, Japan, California, Mexico, Chile, Siberia, Russia, Servia, Bulgaria, Turkey, and elsewhere.

At a later period solid wheels were no longer constructed, as it was found that strength was not entirely dependent upon solidity. The wheels of the Spanish *carreta*, used to-day in New Mexico and Arizona, and that of the Burmese car of state (Fig. 14), are not wholly solid. The wheel is built up of three parts, with a little space between each part. We meet this type in Mexico, Portugal, Chile, Brazil, and other countries, each showing its own modifications of the original model.

As time advanced, the wheel was composed of more and more parts. The parts of the wheel of the Burmese car of state were chiefly of the same piece of material, but the type used in India (Fig. 15), produced by more skilful wheelwrights, were made of different materials. With the appearance of the spokes, we distinguish at once the felly, spokes and hub. We find from four to twenty-one spokes. They are for the most part arranged in one plane, and their purpose is to connect the opposite sides of the felly. A Turkish wheel type, however, has the hub outside of the felly plane, and in such a way that the hub is nearer to the body of the

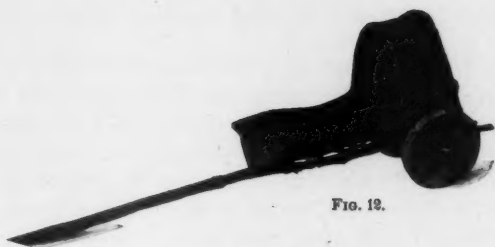


FIG. 12.



FIG. 13.

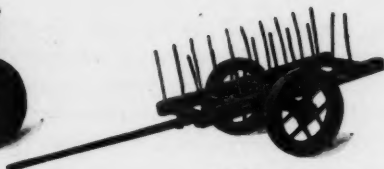


FIG. 15.



FIG. 14.



FIG. 16.



FIG. 17.

- FIG. 12—Russian Bashkir child's coach.
 FIG. 13—Roman farm wagon (*plaustrum*).
 FIG. 14—Burmese car of state.
 FIG. 15—Indian cart.
 FIG. 16—Japanese cart.
 FIG. 17—Persian farm cart.

vehicle than the felly. An analogy to this is found in the bicycle of to-day, with the difference that the spokes of the wheel run to the two ends of the hubs. The wheels of the Indian type contained eight, or more precisely four, double spokes and four felly parts, the Japanese type (Fig. 16) shows twenty-one spokes and seven felly parts. The hub is of two parts, and very strong, as is the felly also, their purpose being to carry very heavy loads.

In the Persian farm cart (Fig. 17) is a striking variation in the form of the spokes. The five longer and thicker single spokes connect the joints of the five felly parts with the hub; the five double shorter and thinner spokes connect the middle of each felly part with the hub. The polygonal shape of the inner wheel-surface is peculiar. It is a type which we find in Germany (sixteenth century) as well as in Servia to-day, and elsewhere, with the small difference, that the one in Germany has ten spokes and ten felly parts, the one in Servia seven spokes and five felly parts. The shape and location of the spokes is very different in the triumphal cars and war and race chariots of Germany, France and other countries, in different ages.

All these wheeled vehicles, except chariots, were used mostly for heavy loads on rough roads and for that reason were clumsier and stronger. Later, when they were introduced for purposes of war, and for passenger transportation, they had a lighter and more elastic form, as we see in the chariots of the ancient nations.

The Greek and Roman *biga*, the Greek *scytala* and *diphron* are all two-wheeled vehicles for the purpose of war and for racing. The warrior and racer stood up in the chariot. The seats of the vehicles came at a later date. The two following photographs represent Egyptian chariots. That from the Ptolemaic era (Fig. 18) is very primitive. It was built of wood and the parts were held together by rawhide straps.

In the Egyptian chariot of the third century, B. C. (Fig. 19), constructed of metal, a decided advance is seen over the earlier vehicles which were entirely of wood. The introduction of metal signifies a turning-point in the history of vehicles. The wheels were covered with metal tires, or were roughly shod, like those of the Assyrians and Persians; the axle is of metal and the hubs are lined with metal to prevent friction and the wearing away of axle and hub. The Scythians and Gauls before the Christian era, and the Britons of the first century, A. D., used also scythes on the hubs of their wheels, as well as on the sides of the body of their

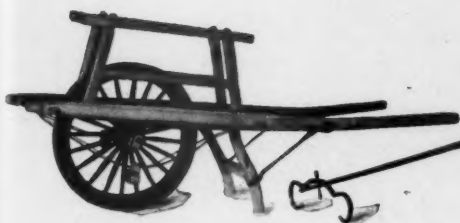


FIG. 20.



FIG. 19.



FIG. 22.

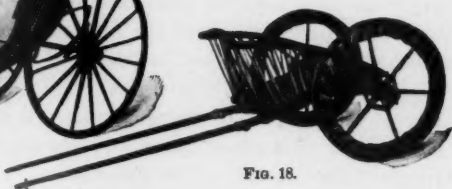


FIG. 18.



FIG. 21.

FIG. 18—Egyptian chariot of the Ptolemaic era.

FIG. 19—Egyptian chariot of the third century B. C.

FIG. 20—One-wheeled Chinese vehicle.

FIG. 21—Korean royal vehicle (one-wheeled).

FIG. 22—Japanese jinrikisha.

wagons for offensive purposes. In some vehicles even the spokes of the wheels are of metal, or the whole vehicle is of metal, as in the Egyptian chariot (Fig. 19).

The one-wheeled vehicle of the Chinese (Fig. 20), used for passengers and all kinds of freighting, belongs to the group of vehicles with metallic parts. The loads are placed on both sides of the wheel, or behind it. To this group belongs the Korean royal vehicle (Fig. 21), in which the tire of the wheel is of metal plates riveted together over a wooden foundation. The lightness of the wheel gives elasticity to the vehicle and increases its speed.

The improvement in vehicles reached its highest degree in the introduction of springs and india-rubber. Springs were used for the first time in the second half of the eighteenth century and elliptical springs in the first years of the nineteenth century. At first they were used only for passenger vehicles, taking the place of the leather supports that held the body of the vehicle. In the nineteenth century, before the invention of railroads, the bodies of the stage coaches generally in use were hung on these strong leather straps. The purpose of the springs as well as of the leather supports is the same. They not only save wear on the coach, but also contribute to the comfort of the passengers.

Without referring generally to passenger vehicles supplied with springs, attention may be called to the Japanese jinrikisha (Fig. 22), and to British and American two-wheelers in the passenger service as special forms. The American type differs from the Japanese in that the load is carried on the back part of the coach, and the propelling is represented in America by the horse and in Japan by man. The literal translation of jinrikisha is "man-power car."

Wagons with springs for transporting heavy loads were products of the last eighty years of the nineteenth century. The application of springs is not universal partly on account of their cost. India-rubber is an aid to the springs, its purpose being to diminish the percussion and to increase comfort. This is also an invention of the last years of the nineteenth century. The roller-skate has either two or four wheels, and with or without india-rubber.

In summarizing these remarks on the development of muscular-power vehicles, it may be said that they were at first made entirely of wood, then partly or entirely of metal, and later were improved by the introduction of springs and india-rubber. The development of the wheel has been traced from the solid wheel to those that were partly solid and then finally provided with spokes. Many small

differences and improvements have not been mentioned because they add nothing of importance to the history of the development of vehicles. The chariots were for other purposes than either the American two-wheeled gigs or the Japanese jinrikisha.

We have discussed the development of the primitive transportation carriers, without treating vehicles propelled by machinery, the second part of the group of vehicle carriers. By understanding the development of human culture, we are enabled to understand the development of vehicles. The high degree of culture among the ancient peoples brought with it so complete an adaptation of vehicles to human needs, that the mediæval nations contributed almost nothing to their improvement. Only the nineteenth century brought great change, and especially in the last eighty years has the progress completely overshadowed the efforts of the previous five centuries.

THE ISLES OF CALIFORNIA

By GODFREY SYKES

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The first thirty years of exploration in and about the great South Sea, after its discovery by Balboa, cleared up many of its major problems for both navigators and geographers. Magellan's voyage had given a true conception of its size; Juan Fernandez had solved the difficulty of the navigation of the southern part, and the new ocean had in fact already been crossed at least twice from the western coast of New Spain: first by Juan de Saavedra in about 1527, and again by Ruy Lopez de Villalobos in 1542.

These trans-oceanic voyages had, however, so far all been made in the one direction, from east to west, since no navigator had as yet solved the problem of battling with the trade winds. In the meanwhile coastwise exploration had been carried on both north and south from Darien, and some little knowledge gained of the adjacent lands.

Among other points which would seem to have been adequately settled by this time was that as to the true nature of the Californian peninsula and gulf. This question was nevertheless destined to prove one of the most vexed of all problems in Pacific geography; not to be finally settled for over 200 years, and giving rise during that time to many curious mistakes in maps and records.

The Spanish conquerors had pushed out towards the north and west after Montezuma and his capital city had been subjugated, and an expedition was despatched by Cortes for the examination of the western coast of New Spain as early as 1528; and from this time until 1540, he stood sponsor for, or himself conducted, various journeys of discovery into this still practically unknown region. One such expedition had worked its way northward along the coast as far as lat. 27° in 1532, under the leadership of Hurtado de Mendoza, and must undoubtedly have sighted the high land of the Californian peninsula to the westward. The next year another expedition was sent out, which ended, as many did, in dissensions and mutiny. Fortuno Ximenes, the successful leader of the mutineers, then sailed to the west, doubtless for the purpose of learning more about this new land; and so was the first Spaniard to set foot thereon.

Another party followed under the personal leadership of Cortes in 1535, and a sustained attempt was made at settlement upon the new shore. This was put an end to, however, by the temporary political troubles of Cortes, and it was not until 1539 that anything further of importance was done. In that year Francisco de Ulloa examined the Gulf of California pretty thoroughly, although he did not succeed in quite satisfying either himself or his superiors as to the conditions at its head. In the following year, 1540, Fernando de Alarcon, acting in connection with the work of Francisco Vasquez de Coronado ashore, fully settled the question as to the mouth of the Colorado River, and brought back a fairly accurate chart of the region, made by his chief pilot, Castillo (Fig. 1).

This expedition, together with the voyage of Cabrillo and Ferrel in 1542-1543, when lat. 44° was reached along the outer coast, should have fully determined the true nature of California; but in spite of the thorough work of these pioneers, which was apparently accepted as conclusive by geographers for many decades, doubts arose and map makers began to modify their views and show hesitation as to its real nature and configuration.

Jodocus Hondius seems to have been one of the first of the better known map makers to cast doubt upon the accuracy of the work of Ulloa, Alarcon and Castillo, and his maps of about the beginning of the seventeenth century show a widening of the gulf at its upper part, and although still somewhat after the manner of Castillo, indicated that a further extension might exist beyond.

If it is true, as some historians have surmised, that Hondius was

the author or designer of the famous silver map of the world, commemorative of the circumnavigation of the world by Sir Francis Drake,¹ his ideas or information must at that time have been slightly different, inasmuch as the great lake which is a feature in both maps above the head of the gulf, lies much farther to the west in

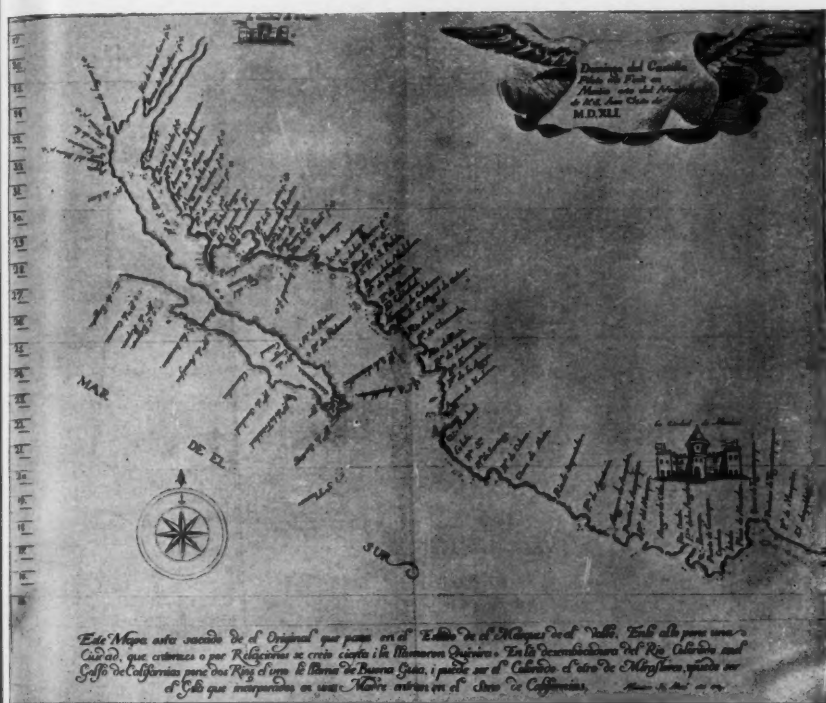


FIG. 1.—Castillo's chart of the Gulf of California.

the silver map and the gulf has a definite ending. At all events, in his map of 1611 (Fig. 2), Hondius drew the indefinite upper part spoken of above. Other cartographers, as for instance Plancius, either followed the lead of Hondius or worked along similar lines themselves; the indicated opening was gradually extended, became defined, and at length reached the Pacific; and so California was shown as a true island (Fig. 3).

¹ The Drake Medal. By James D. Hague. *Bull. Amer. Geogr. Soc.*, Vol. 40, 1908, No. 8, pp. 449-469.

The reasons for thus setting aside the results of what appears to have been careful and well-organized exploration have never been fully explained, but may have been either preconceived notions as to the existence of a great island in this region; a misunderstanding of native reports which were doubtless in themselves incomplete and erroneous; or later and inadequate examinations of the coasts by expeditions whose members lacked the courage and resolution of Alarcón and his companions.

In addition to any of the above reasons, there was perhaps a plan upon the part of the Spanish conquerors to mislead and mystify adventurers of other nationalities, by means of erroneous charts and information. In view of the error having possibly arisen through preconceived notions, it will be well to glance briefly at what is known or surmised concerning the origin of the name of California.

It was pointed out as long ago as 1862 by the late Edward Everett Hale, that this name had in all probability been adopted from a romance written by García Ordóñez de Montalvo early in the sixteenth century, at a time when western exploration and adventure were at their zenith. This point in nomenclature seems to have escaped the notice of earlier historians, both Spanish and English, but there can be little doubt as to its accuracy. The romance in question was "The Adventures of Esplandian," written as a sequel to "The Famous Adventures of Amadis de Gaul." The author depicts a pagan queen, Calafre by name, hailing from a land of California or Califorine (it is spelled indifferently in either way), which lies beyond the Indies and is in one place described as "confirming on the head of the River Boristeness" (the Dnieper), but later on in the tale more definitely as an island, and exceedingly rich in such pelf as adventurers in the sixteenth, or indeed in other centuries, have been wont to seek more arduously. Books were not so plentiful in those days as in these and were perhaps taken more literally by their readers, and doubtless a tale as stirring as Montalvo's great romance would appeal to and excite the imaginations of these treasure-seeking followers of Cortes.

Be this as it may, the name California, which seems to have been first applied merely to the country round about the Bay of Santa Cruz or La Paz, was quickly adopted for the whole of that mysterious land which lay off in the ocean to the west of the New Spanish domain, and this being California, why should it not be an island as Montalvo had described in spite of such mundane details

as maps and charts? This, and like considerations and ideas may in a measure have influenced the minds of the explorers and tintured their reports; but the fact that the first landings were made



FIG. 2—Map by Jodocus Hondius, 1611, showing indefinite ending to the Gulf of California.

down near the southern extremity of the peninsula, where native reports concerning physical features several hundred miles to the north would be necessarily vague and scanty, was perhaps a more potent cause in fostering uncertainty as to its real nature and extent.

Winsor is authority for the statement that the newly discovered land was spoken of as an island by Cortes himself as early as 1524, upon the strength of native reports, which in this case would mean information gained from natives on the mainland. Bancroft credits Preciado with the first published use of the name California in his account of Ulloa's voyage, and but one serious attempt was ever afterwards made to change it. Charles II caused an expedition to be fitted out for the further exploration of California and conversion of the natives in the years 1681-1685, and it was then in his honor rechristened Nueva Carolina. The new name was never generally accepted, however, and California was soon readopted.

In Castillo's map no name was given either to the peninsula or gulf and the earliest specific naming of the latter which I have been able to trace occurs in a beautifully executed manuscript portolano of about 1540, now preserved in the British Museum.² In this map the Gulf appears as the Mar Vermeio, and is still further identified as such by being hatched in red. Tramezini, the Venetian cartographer, gave it also the name of Mar Vermeio in the upper part, but called the lower portion Golfo Novo, in his map of 1554. It was occasionally called "The Sea of Cortes" and once or twice *Californiæ Sinus*, but the Vermilion Sea was the name which survived.

Alarcon's report, and Castillo's map of the head of the gulf made known the existence of the mouth of a great river; but the pilots were sadly hampered and the mariners alarmed by the enormous tides and violent currents which were encountered. These constituted grave perils for vessels found and equipped as were these early Pacific caravels, and additional trouble was experienced by reason of the generally unapproachable and inhospitable shore thereabouts, where the desolate expanse of soft mud makes landing almost impossible. Illusive mirages and refractions so prevalent in this region added to the difficulties of accurate observation and Castillo's chart did him great credit under the circumstances.

There were doubtless other members of the party, however, whose geographical instinct was less keen, and whose conflicting reports would carry some weight upon the return of the expedition, since no very definite record of Castillo's work seems to have been left in Spanish or Mexican archives. Accounts of voyages made into the gulf subsequent to that of Alarcon are in general very fragmentary, but as the pearl fisheries were beginning to be known they no doubt served as the incentive for many such enterprises.

² Egerton MSS. 2854, No. 4.



FIG. 9.—Map by De For, 1720, giving the alternative name of Carolinas to the Californian group of islands. This map also shows the rivers Tison and Coral debouching into a bay just below the Isle of Giganta.

Lorenzana, in his history of New Spain, published in Mexico in 1770, gives a list of such as were known to him, beginning with that of Sebastian Viscaino in 1596. This leaves a hiatus of over 50 years during which many smaller expeditions must have attempted some exploration of the region.

Lorenzana says in his account that Viscaino sailed for the gulf as a counterstroke to the voyage of Drake ("the corsair"). He entered the gulf, put in at a port which he named San Sebastian, took possession of "The Californias" in the name of His Majesty Philip II, and reconnoitered the interior. He then renamed Cortes' Bay of Santa Cruz, La Paz, and returned to New Spain "after many labors and fatigues." He visited California again in his better known voyage of 1602-1603, upon which occasion he examined the outer coast from Cape San Sebastian to Monterey. He was followed into the gulf by Juan Yturbi in 1615, Francisco de Ortega in 1632 and twice later, Estevan Carbonelli in 1636, Don Luis Cestin de Canas in 1642, Señor Don Garcia Sarmiento in 1643, and Almirante A' La Vela in 1644.

Venegas, in his history of California, gives the following note concerning the voyage of Yturbi or Iturbi, mentioned above:

"Juan Iturbi sailed up the Gulf in 1615 with two ships. One of these was taken by pirates (European), who were called Pichilingues, and who infested the South Seas. Iturbi entered the Bay of California and sailed up to 30°, when he found that the two coasts of California and Sinaloa were approaching each other. Northwest winds, however, prevented him from going any further north. Father Andres Perez de Ribas afterwards wrote an account of this expedition. At this time the Dutch corsairs also openly infested these seas under their own colors."

That other expeditions concerning which nothing is as yet definitely known followed that of Alarcon, and brought back conflicting reports, is evident from sundry passages in Hakluyt, Purchas and other contemporary writers. A letter "written by one Ludovicus Tribaldus Toletus to Mr. Hakluyt, touching Ivan de Onate, his discoveries in New Spaine, written at Valladolid, the Nones of July 1605" contains the following:—"Moreover other newes is brought from New Spaine, to wit, that by the Commandment of the Viceroy the coasts of the South Sea towards Cape Mendocino are discovered, and that exceeding faire and large Havens are found neere the Californias which hitherto no man knew."

Purchas, who was always avowedly an advocate of the island hypothesis concerning California (Fig. 4), says in a marginal note anent the above:—"Western coast of America discovered nere Cape California, which it seems at this time was more perfectly discovered to be an Iland, as you may see in M. Briggs his map."



FIG. 4.—Map of North America from Purchas' Pilgrims showing California as an island and three large rivers emptying into the sea in close proximity to the Isle of Giganta.

Again in referring to the controversy as to the insularity of California, he writes:—"A letter 1595 from Los Angeles calleth them Ilands and sayeth they are rich and that the Viceroy sent to conquer them." The original of this letter is given by Hakluyt.

It is related by several historians and geographers in the seventeenth and eighteenth centuries that California was reputed to be an island on the authority of a Spanish chart taken from a ship captured by the Dutch in or about 1620. I have met with numer-

ous references to this captured chart, but have not as yet been able to identify either the chart itself or authentic copies of it. It is certain, however, that during the first quarter of the seventeenth century California was almost universally looked upon as being an island or group of islands.

In 1565 the sailor-priest Andres de Urdaneta succeeded in crossing the Pacific from west to east and made a landfall upon the American coast in about lat. 40°. He was followed by Francisco de Gali and others, and the frequent voyages of the richly laden ships from Manila to the western ports of New Spain were the results of these successful crossings. It was this trade which especially attracted the pirates of various nationalities who speedily began to infest the South Sea. One of the first of these great Spanish ships to be captured was taken by the English Captain Thomas Candish, or Cavendish, in 1587 off Cape San Lucas, and from that time onward they were considered to be fair game. It seems certain that, with this serious danger menacing their trans-Pacific ventures, the Spaniards would endeavor to become thoroughly acquainted with the coast down which they had to work for nearly a thousand miles after making their landfall. The existence or non-existence of a great island parallel to the mainland, and offering an alternative inside route for the homeward voyages of these harassed vessels, would therefore become a question of the greatest consequence to their mariners, but the information gained about it a matter to be strictly guarded.

How far their real knowledge extended, or where the records of it may be hidden, are points which it would be of the greatest interest to clear up; but it at least seems to be evident that even if these early Pacific pilots procured correct information as to the nature of the coast, it was afterwards lost sight of with the decline of the Manila trade.

Captain William Dampier, writing in 1699 concerning his voyage round the world, has this to say about the Californian question at that time:—"This lake of California (for so the sea channel or straight between that and the continent is called), is but little known to the Spaniards by what I could ever learn; for their drafts do not agree about it. Some of them do make California an island, but give no manner of account of the tides flowing in the lake, or what depth of water there is, or of the Harbours, Rivers or Creeks that border on it; whereas on the west side of the island, towards the Asiatick coast, their Pilot book gives an account of the

coast from Cape San Lucas to 40° N. Some of the drafts newly made do make California to join the Main. I do believe that the Spaniards do not care to have this lake discovered, for fear lest other European Nations should get knowledge of it."

The library of the American Geographical Society contains a map published by Coronelli in 1688 (Fig. 5), which affords an excellent illustration of the common views of geographers during the latter part of the seventeenth century concerning California and the adjacent regions. The coast is shown in great detail all round the island, which extends from lat. 23° to lat. 46° N. A double gulf is shown on the eastern shore of the Mar Vermeio, which is clearly intended to embody the discoveries of Alarcon and his companions, and the narrow part of the sea to the north of this entrance is partially obstructed by several great islands. The most southerly of these is named *Isla Gigante*, and this name, together with the configuration of the coast to the east, may perhaps afford a clue to the origin of the island hypothesis, as will be explained later on.

The various maps of Sanson, Moll, Meurs, and others show in general about the same features and clearly embody the same ideas.

One of the few map makers of note who seemed to mistrust the island theory was Robert Dudley, the author of the "*Arcano Del Mare*," published in 1661. In contradiction to most geographers, he drew an almost straight coast line for northwestern America, with a direct opening therein for the mouth of the gulf. In his detailed charts, however, he rather evaded the question of the upper part of this gulf by so dividing his sheets as to omit it.

Sanson's maps were widely copied by succeeding geographers, and their influence can be traced even as late as 1725 in some of the maps by Senex and others, although Father Kino's explorations had in reality settled the question of the non-insularity of California nearly a quarter of a century before.

The myth was slow to die, though, for even so well-informed a traveler as Capt. Shelvocke in his account of his voyage round the world, published in 1726, wrote as follows:—"As to the bounds and extent of California, our geographers have never yet been able to determine either by their own observations or information from others, whether it is an island or part of the continent of North America." Many other writers even as late as the middle of the eighteenth century still held to the idea of an insular California.

Although coastwise and marine exploration had been slow and

desultory in the gulf, exploration by land from the Sonoran settlements towards the Pacific coast had been slower still, and it was not until the end of the seventeenth century that anything definite was accomplished in this direction. The reasons for this inactivity and seeming apathy are obvious. The Sonoran settlements were in themselves for the most part small and poor, and there was little incentive to travel across the terrible stretch of desert which lay towards the northwest.

The same obstacles which existed in the seventeenth century exist in some measure still, and a journey overland from the Sonoran settlements to the head of the gulf is not a matter to be lightly undertaken even to-day. The shores of the gulf itself from Guaymas as its eastern shore, to Muleje on the west, are practically as deserted and difficult to exist upon as they were in the days of Alarcon.

In the year 1693 Father Eusabio Francis Kino, who was then engaged in missionary work in Sonora, first sighted the gulf, and from then onward until 1706 this indefatigable explorer made various journeys into the region about the mouth of the Colorado, and although he never actually penetrated beyond the river itself, he at length fully satisfied himself that Lower California was indeed a peninsula. The good father was gifted with keen geographical instinct, was a careful and accurate observer, and possessed to an eminent degree the happy faculty of extracting and appraising at its true value information received from native sources, and the maps which he made were wonderfully correct.

The complete overland journey and examination of the country from Sonora to the Pacific was, however, reserved for later explorers, being accomplished by Garces, Font and others late in the eighteenth century. Map makers and geographers were in general extremely conservative about reuniting California to the mainland, and one finds numerous references to it as an island even as late as 1750.

Two English cartographers, Green and Rocque, published good and complete maps about that time and the long continued fiction of the Isles of California came definitely to an end (Fig. 6).

Mention was made above of an embryonic gulf which appears in many of the earlier maps upon the eastern shore of the Mar Vermeio in juxtaposition to a great island, and if the original error arose through failure of later expeditions to follow and verify the work of Alarcon, this may indeed furnish us with some clue as to what really happened.

There exists (Fig. 7) between the Island of Tiburon and the Sonoran coast, in lat. 29°, a narrow and tortuous passage, well named El Infernillo, which is almost fordable at dead low water,



FIG. 5—Map by Coronelli, 1688, also showing Isle of Giganta and gulf in shore of New Spain.

but traversed by extremely violent currents at other stages of the tide, and this, when approached from the south, bears a strong resemblance to the mouth of a great river. The illusion is strength-

ened by the banks and shoals which obstruct its entrance, and the configuration of the Tiburon and Sonora shore lines suggest a gulf or deep bay with a river entering the upper end. Upon the east shore of this gulf a series of openings and lagoons connect with the Rio Sonora when the latter is in flood.

It is easy to see how a coastwise expedition coming up from the south, and not too certain either as to its own latitude or that of Alarcon's reported great river, might suppose that it had reached the latter, and turning down again and rounding the southern point of Tiburon Island, find the open water beyond and so conclude that Alarcon had been mistaken in supposing that he had reached the head of the gulf. The distance from Tiburon Island to the shore of California is not great:—scarcely thirty miles, and partially obstructed by two islands, San Esteban and San Lorenzo of the modern charts.

The great island of Angel de la Guardia lies only a few miles to the northwest, and it is a significant fact that in all maps which showed the Mar Vermeio as a strait and California as an island, no real names are ever given north of this region and the Isla Gigante or Angel de la Guardia Island is always drawn near to the supposed gulf of Alarcon. While no direct record has as yet been discovered of such an expedition having been made, the presumptive evidence is good that something of the kind occurred and was perhaps responsible for the captured Spanish chart.

The island hypothesis gained such wide and rapid credence as to render it almost certain either that some definite and *bona fide* report contradictory to that of Alarcon reached New Spain about the beginning of the seventeenth century or that a well-planned and sustained effort was made by the Spaniards to mislead sailors and geographers of other nationalities concerning affairs on this coast. Of the two explanations, the former seems to be by far the more probable in view of the natural conditions outlined above.

The theory sometimes propounded that the early Spanish navigators were influenced in their opinions as to the insularity of California by having penetrated by water into the basin which we now know as the Salton Sink, may I think be dismissed at once as highly improbable; for even if this depression was at that time filled by the overflow waters of the Colorado River (which is not in itself at all impossible), the fact that it was entered by stemming a swift fresh-water current, and that once reached, the great tides experienced in the gulf were totally absent, would at once show any voyager that he had left the sea and reached a lake.

The existence and discovery of such a lake at that time is not at all unlikely and may have been responsible for the Lac Magnus or Lac del Oro of so many of the early maps; but I doubt whether it was ever actually entered by boat in spite of the oft-repeated tale of the discovery some years ago of the bones of an ancient Spanish vessel in the dried mud of the Sink.³



FIG. 6.—Chart of the Pacific Ocean by John Green, 1753, giving a fairly accurate representation of California and the Gulf.

To summarize, then, the facts which are already known, and the points upon which it is reasonable to conjecture concerning this interesting historical and geographical puzzle: It appears that the first seemingly adequate exploration of the Californian coasts and gulf by Ulloa and Alarcon was commonly accepted until about the beginning of the seventeenth century, when the ideas of geog-

³ W. C. Mendenhall. The Colorado Desert. *Nat. Geog. Mag.*, Vol. 30, 1902, p. 685.

raphers began to veer towards the theory that California was an island, and that this theory was confirmed in the opinion of contemporary writers by a certain chart which was taken from a Spanish ship by the Dutch.

Further, that the error became almost universal and was persisted in for at least a half century after Father Kino's journeys about the head of the gulf had again showed the fallacy of this island hypothesis.

So much is certain. As regards the conjectural points it is obvious that the original error came from the Spaniards; probable



FIG. 7.—Tracing of a portion of the U. S. Hydrographic Office chart of the Gulf of California showing the islands of Angel de la Guardia and Tiburon, and part of the Sonoran coast.

that it arose through the hazardous navigation of the gulf and consequent failure of some later expedition fully to retrace Alarcon's route; and possible that it was at first due to an effort upon the part of the Spaniards to mislead and mystify foreign poachers upon their preserves, their own later mystification arising through the overlooking or loss of the original data.

The maps and records which have a bearing upon the Spanish discovery and early exploration of the western part of the new continent, are so scattered among the great collections of the world, and the relationship of the various maps to each other or to actual exploration has as yet been so little touched upon, as to render an inquiry into these interesting historical questions a matter of considerable difficulty.

It is quite essential, however, that their solution be undertaken with a full appreciation of the obstacles which confronted these early voyagers, and some local knowledge of the physical features which they encountered in the western deserts and along the shores of the Great South Sea.

THE COAL RESOURCES OF THE WORLD: A SUMMARY

By LEON DOMINIAN

An investigation of the world's coal resources was undertaken by the XIIth International Geological Congress held in Canada in the summer of 1913 with a view to estimating the tonnage available in known fields. The results of this inquiry have been embodied in a valuable monograph.¹ The importance of the topic suggests interpretation of certain facts from the standpoint of the geographer.

Coal is the most valuable mineral exploited in the world. The product, once taken out of the earth, cannot be replaced. The study of its reserves, therefore, appeals to millions of human beings whose comfort and material fortunes depend directly on the production of this fuel. Its exhaustion in any country would seriously hamper operations in hundreds of factories.

The relation of coal to civilization is apparent from an inspection of any world-map. The heaviest coal producing countries lead in civilization. A large portion of the wealth per capita in each may be traced directly to the hives of industry and the centers of population that cluster around the sites of their coal supplies. The factor of area or of geographical position appears overshadowed by the importance of that of coal resources. Belgium is a case in point. This does not imply, however, that civilization depends on coal entirely. It means that nineteenth or twentieth century civilization alone is based in part on coal consumption. Given the discovery of an economically more advantageous source of energy, and coal will become as unimportant from the standpoint of the world's commerce as trade winds in our day.

The bulk of the world's supply of coal is stored in the continental areas of the northern hemisphere. North America and Eurasia contain approximately six-sevenths of the total reserves. The fuel is distributed most abundantly north of the 20th parallel of north latitude. This is not due so much to the development of

¹ The Coal Resources of the World, Vols. I, II, III, Atlas. Morang & Co., Toronto, 1913.

large land masses in the northern hemisphere as it is to the existence of vast areas of rocks belonging to the Carboniferous period which are not well represented either in Africa or South America. A factor of far-reaching economic importance in the commercial and industrial relations between northern and southern continents is thereby created. Industrial supremacy of the northern continents is insured as long as coal is not superseded by another fuel or new reserves are not discovered in the southern continents.

Considered as a factor in regional development coal has contributed more than any other mineral to modify the aspect of certain sections of the earth's surface during the past 75 years. Areas of industrial activity provided with intricate networks of communication and thickly populated settlements have originated as a result of the presence of the fuel.²

As a rule it will be found that one of the strongest currents of emigration from country to city centers around coalfields, the exodus towards cities being much less pronounced in countries where coal is scarce. The quality of coal is often a factor in determining density of settlement. The large human agglomerations found in the coalfields of Great Britain and Germany or of Pennsylvania are regions in which exceedingly high-grade coals are exploited. The demand for lignite at the other end of the scale is not excessive in manufacturing or industry. Lignite basins consequently are not characterized by the presence of large industrial communities. These are conditions which prevail at present. Conversion of lignite into producer-gas is enabling it, however, to acquire increasing importance as a source of power. The development of producer-gas plants will undoubtedly lead to heavier mining of this grade of fuel. Its value as a factor in economic geography will increase correspondingly.

The absence of coal has generally retarded manufacturing progress. The state of California affords an excellent example of a region in which industrial development was delayed despite favorable geographical conditions, until oil and long-distance electric power transmission came into use. It may be asserted that the influence of coal as a factor in human geography will continue to be exerted until the mineral is replaced by a cheaper source of energy.

About 70 per cent. of the estimated tonnage of the world is stored in the western hemisphere. The coalfields of the North American

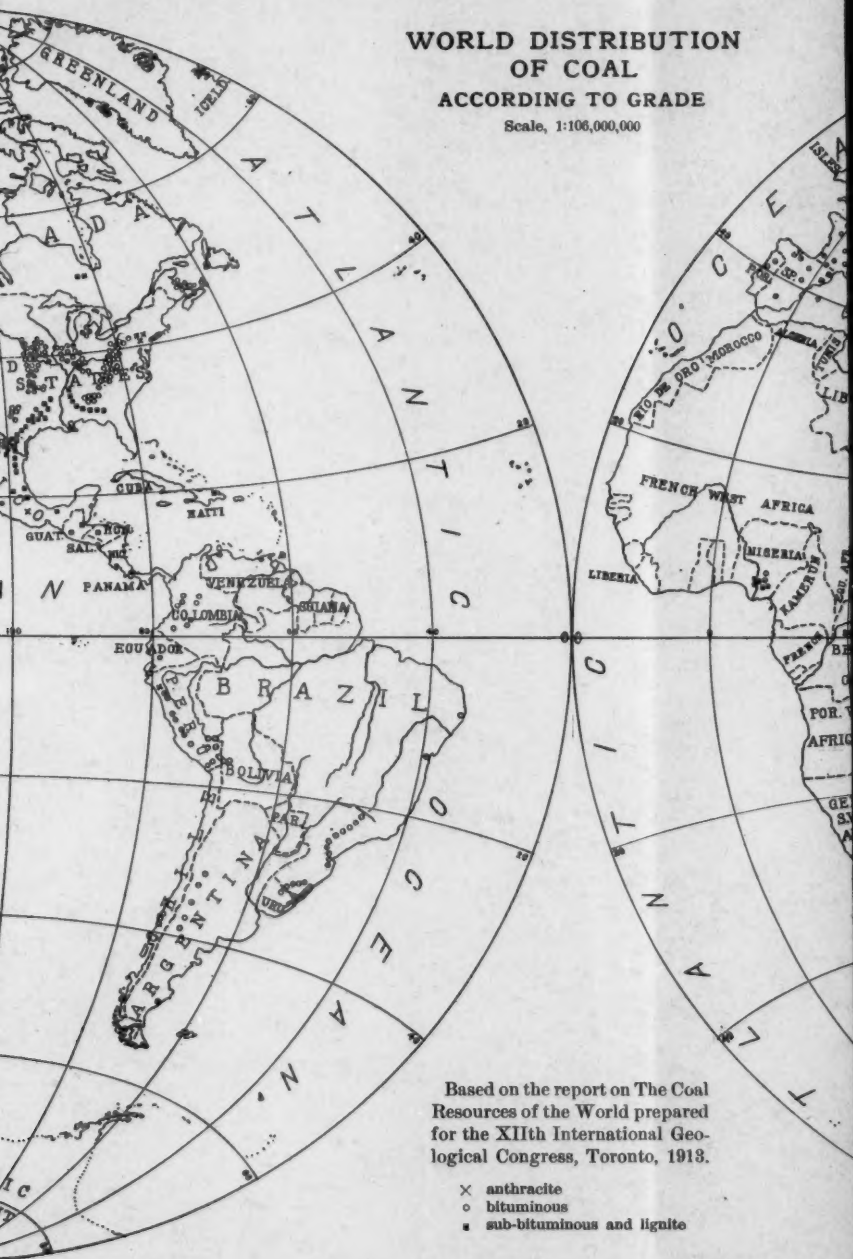
² Cf. Brunhes' admirable treatment of the geography of coal in *La Géographie Humaine*, pp. 406-456; and compare the two editions of the MacAllister sheets published by the U. S. Geological Survey, to which reference is made.



WORLD DISTRIBUTION OF COAL

ACCORDING TO GRADE

Scale, 1:106,000,000

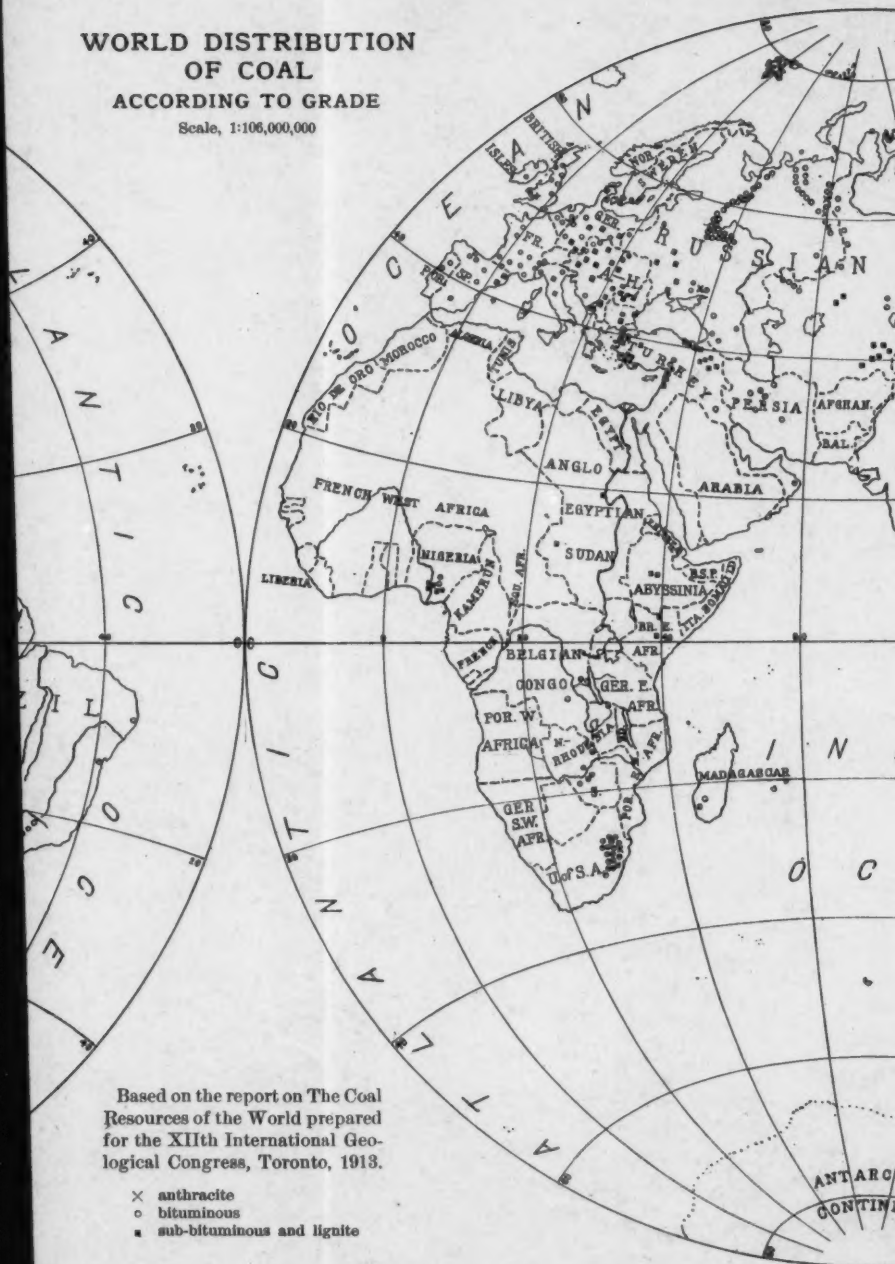


Based on the report on The Coal Resources of the World prepared for the XIIth International Geological Congress, Toronto, 1913.

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- o bituminous
- sub-bituminous and lignite

WORLD DISTRIBUTION OF COAL ACCORDING TO GRADE

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continent are situated between the Rockies and the Appalachian highlands. Two-thirds of the world's total supply is contained within this area in the shape of every possible grade of the fuel. The highest grades have been discovered so far along the eastern front of the Appalachian region and in the Arkansas fields. Both of these areas lie in the vicinity of centers of heavy geological disturbances and mountain building. In the west, the Pacific region cannot compare for abundance of coal with the Rocky Mountains or northern Great Plains areas. Nevertheless, the westernmost states carry supplies which are by no means inconsiderable. South American countries are not self-dependent for their coal supply. They offer markets of consumption which deserve investigation on the part of northern producers. It is well to bear in mind, however, that South America is not so thoroughly prospected as the North American continent.

Eurasian coal is distributed principally in the vicinity of the seas which surround this land mass. The bituminous fields of northern Russia spread southward from the Arctic Ocean. The abundant reserves of the Belgian-German basins are cut off from the British fields by the waters of the North Sea just as the Japanese beds are separated from the fields of northern China by the Sea of Japan. Proximity of coal beds to the sea is observable in the Mediterranean basin. The two important coalfields of the Indian peninsula almost reach the shores of the Indian Ocean. Coal measures in China are likewise distributed from the Pacific Ocean inland. The province of Shantung is well favored in this respect and enormous bodies of anthracite are known in the broad plains of Honan, and Szechwan. Nevertheless, although central Eurasia contains relatively small quantities of coal, almost every one of its sovereign states has been provided with commercial quantities of the fuel. Taken according to grouping, the coalfields may be divided into the two major districts of Atlantic and Pacific fields. To the west over one-tenth of the world's reserve lies beneath the subsoil of Europe, while approximately twice this quantity is known to exist in the Pacific or eastern field. Requirements of European civilization have brought about an enormous production in the Atlantic Eurasian field, the reserves of which are therefore being rapidly depleted.

The following estimates are reproduced from the monograph published by the Congress. Discoveries of new fields in the past two years, such as the lignite beds of the Bonnifeld region about 50 miles south of Fairbanks, Alaska, give appreciable increase to the totals set forth below.

TABLE I—ESTIMATED COAL RESERVE OF NORTH AMERICA
In Million Tons

Country	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
Canada	2,158	283,661	948,450	1,234,269
Newfoundland		500		500
United States	19,684	1,955,521	1,863,452	3,838,657
Central American Countries		1	4	5
Totals	21,842	2,239,683	2,811,906	5,073,431

TABLE II—ESTIMATED COAL RESERVE OF SOUTH AMERICA
In Million Tons

Country	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
Venezuela		5		5
Colombia		27,000		27,000
Peru	700	1,339		2,039
Argentina		5		5
Chile		3,048		3,048
Totals	700	31,397		32,097

TABLE III—ESTIMATED COAL RESERVE OF EUROPE
In Million Tons

Locality	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
Spitzbergen Islands		8,750		8,750
Farøe Islands			50	50
Sweden		114		114
Russia	37,599	20,849	1,658	60,106
Great Britain and Ireland ..	11,357	178,178		189,535
France	3,271	12,680	1,632	17,583
Holland	320	4,082		4,402
Belgium		11,000		11,000
Germany		409,975	13,381	423,356
Hungary		113	1,604	1,717
Austria		40,982	16,570	57,552
Italy	144		99	243
Rumania			39	39
Servia		45	484	529
Bulgaria		30	358	388
Greece			40	40
Portugal	20			20
Spain	1,635	6,366	767	8,768
Totals	54,346	693,164	36,682	784,192

TABLE IV—ESTIMATED COAL RESERVES OF AFRICA
In Million Tons

Country	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
Nigeria.....			80	80
Belgian Congo.....		90	900	990
Rhodesia.....	2	493	74	569
Union of South Africa.....	11,660	44,540		56,200
Totals.....	11,662	45,123	1,054	57,839

TABLE V—ESTIMATED COAL RESERVE OF ASIA
In Million Tons

Country	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
Asiatic Russia.....	1	66,034	107,844	173,879
Manchuria.....	68	1,140		1,208
Japan.....	62	7,130	778	7,970
China.....	387,464	608,549	600	996,613
Corea.....	40	14	27	81
Indo-China.....	20,002			20,002
British North Borneo.....			75	75
Dutch Indies.....		93	1,228	1,321
Philippine Islands.....			66	66
India.....		76,399	2,602	79,001
Persia.....		1,858		1,858
Totals.....	407,637	761,217	113,220	1,282,074

TABLE VI—ESTIMATED COAL RESERVE OF OCEANIA
In Million Tons

Locality	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignitic Coals	Totals
New South Wales.....		118,439		118,439
Victoria.....		52	31,114	31,166
Queensland.....	659	13,693	866	15,218
West Australia.....			653	653
Tasmania.....		66		66
New Zealand.....		911	2,475	3,386
Totals.....	659	133,161	35,108	168,928

TABLE VII—ESTIMATED COAL RESERVES OF THE WORLD
In Million Tons

Continent	Anthracitic Coals	Bituminous Coals	Sub-bituminous and Lignite Coals	Totals
America (North and South).	22,542	2,271,080	2,811,906	5,105,528
Asia.....	407,637	761,217	113,220	1,282,074
Europe.....	54,346	693,164	36,682	784,192
Oceania.....	659	133,161	35,108	168,928
Africa.....	11,662	45,123	1,054	57,839
Totals.....	496,846	3,903,745	2,997,970	7,398,561

The totals obtained in these estimates show that on the basis of the present annual consumption of about 1,300 million tons of coal the world's supply is amply provided for centuries. They also point to the possible shifting of Europe's intensely developed economic fields to American and Asiatic regions. China's abundant resources of the fuel will be undoubtedly reflected in the creation of important centers of industrial activity in the vicinity of the country's coalfields.

STEFANSSON FINDS NEW LAND

No accident has befallen Stefansson and he has been pushing his work with great energy and with admirable results. The widely accepted opinion that he had met, in the north, a westerly drift of the ice that had probably carried him into Arctic waters north of Asia was not correct. On the contrary, he met in the north a prevailing easterly drift that helped him, to some extent, to reach the western coast of Banks Island, which he had distinctly announced, he intended, if possible, to attain. His full report was published in *The New York Times* of September 18; and the news it brought of his safety and of his strenuous and fruitful toil was most gladly welcomed by geographers and the public generally.

The Bulletin announced (Vol. 46, 1914, p. 773) that the explorer had started on his ice trip from Martin Point, Alaska (about 143° W.), on March 22, 1914. Some details were given of the journey north up to April 16, when Stefansson sent the last of his supporting party back. He was left with two men, Andreasen and Storkensen, a dog team, a sledge convertible into a boat, food for men and dogs for 40 days and 360 cartridges for two rifles. His later adventures are here condensed from his report to *The Times*.

The easterly drift was incessant, but he managed to keep a fairly true north course till April 27, when his position was about 73° N. and 140° W. As he had announced that he would go to Banks Island, where he might be reached by vessel, he shaped his course to reach Cape Prince Alfred, at the north-west corner of Banks Island. His kerosene had given out and so he used lard to melt ice for drinking water. Food was getting short and the party pressed on landward as fast as possible; but 43 days before reaching Banks Island they

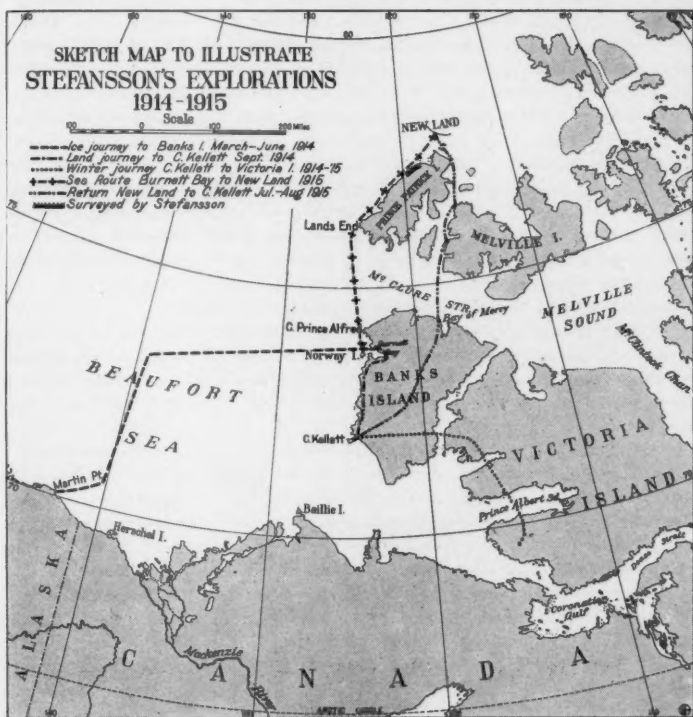


FIG. 1.

killed a seal and for the remainder of the journey lived in abundance. They killed bears and some 40 seals, thus accumulating a stock of food for future needs and plenty of oil for fuel.

When within 100 miles of Banks Island, a strong easterly gale turned the ice-drift west and the party was carried some 60 miles farther away from the land they were trying to reach. It began to look as though they might have to spend the summer on the ice. They had then two tons of meat and blubber, which at least assured them food and fuel. They were able, at last, to recover the lost ground and reached Banks Island; but a southerly drift defeated their

purpose to land at Cape Prince Alfred and they reached the island some thirty miles to the south of the Cape. They landed on June 26, 1914. They had left Martin Point, Alaska, 96 days earlier. In their last tussle to reach land they left nearly all their food on the ice but were soon able to replenish supplies.

On the way, they took advantage of some leads in the ice to make a few soundings, which, perhaps on account of defects in telegraphing, are not very clear as to position. The first bottom sounding on the journey north from Martin Point was 2,407 feet. Towards Banks Island a sounding of 2,086 feet was obtained. At intervals the sounding line did not touch bottom. Nearing the Banks Island coast soundings were taken every 2 or 3 miles. "The soundings seem to indicate that the sea bottom rises in at least 3 terraces towards Banks Island. In some parts the bottom seems either hilly or cut by channels."

The distance actually traveled was probably not over 700 miles and perhaps less.

Stefansson had directed the *North Star* to go up the west coast of Banks Island as far as Norway Island to look for his party. That vessel, however, did not start on the search and the whalers sailing up the coast did not go within 100 miles of Stefansson's camp. The result was that while he was well and working all the latter part of the season in northern Banks Island and during the winter of 1914-15 in Banks Island and Victoria Island, the world thought him dead or adrift somewhere perhaps north of Asia.

When September 1 arrived, Stefansson covered his dried meat caches with stones and proceeded south along the coast with pack dogs to Cape Kellett, where he found the *Mary Sachs* in winter quarters. He at once began to secure fresh meat for men and dogs and by the end of November had ample food supplies.

During the absence of the sun, Stefansson and one of his Eskimos made a 400-mile round trip to the southeast of Banks Island and Victoria Island to search for the Eskimos who usually winter there, but they seemed to have gone elsewhere for the winter. He had hoped to procure dogs from them for the spring work. This hope was not realized, and he had only 17 dogs left—only two possible teams against the four with which he had started from Alaska.

The ice party for the spring of 1915 consisted of Stefansson, Storkensen, Andreassen and Thompsen, all Norwegians except the leader. Stefansson started from the base at Cape Kellett early in February. The party set out over the sea ice from Cape Prince Alfred, Banks Island, in a direction between north and northwest. Owing to sore-footed dogs, thick fogs, soft snow and much open water he did not reach 75° N. Lat. till April 26. Here the sea depth was 900 to 1,200 feet. He skirted the west coast of Prince Patrick Island and finished the charting of the coast line between the farthest points reached by McClintock and Mechem in the middle of the last century. Stefansson's survey completes the charting of the whole coast line of Prince Patrick Island.

On the morning of June 18, Storkensen, from a 40-foot high ice cake near the camp, sighted new land to the northeast. "This camp was pitched at 77°56' N. and we landed next day on the land at a point distant about 14 miles, near 78° N. and 117° W. The trend of the coast here was northwesterly, but thick weather prevented us seeing far. On account of the lateness of the season we followed the coast east for three days only.

"Thick weather prevented sextant observations except one day which gave

77° 48' N. and 115° 43' W. We actually saw only about 100 miles of coastline running somewhat south of east from the landing place, but mountains were seen for at least 50 miles farther east and from a height of 2,000 feet, 20 miles inland, still higher hills were seen in all directions from north to east at a distance estimated at over 50 miles.

"The land therefore is of considerable size. It is low where we first landed, but becomes higher and more rugged as one proceeds eastward."

On the return Stefansson followed the west coast of Melville Island south, crossed to the Bay of Mercy in Banks Island and went on diagonally across Banks Island to Cape Kellett. Later he found that his survey parties, east of Herschel Island, had made considerable progress in their work. He chartered the *Polar Bear* to get supplies from Herschel Island and to land them next season, so as to form a more northern base for next year's work either on Banks Island or Prince Patrick Island. He plans to make a further journey next year into Beaufort Sea and attempt thorough explorations in the new land already discovered. He expected to sail for Banks Island on August 23, the day after he wrote his news dispatch.

His last two years' work almost eclipses the brilliant record he had already made. Stefansson has established his reputation as one of the ablest, most resourceful and most fruitful investigators of the Polar regions and their inhabitants. He has reached this eminence not only through his great fitness in planning and carrying out his work but also because he seems to have a perfect understanding of nature and life in the Arctic. He has learned better than most men how to live and how to work among the conditions that are met there.

REPORT ON ALASKAN FISHERIES AND FUR-BEARING ANIMALS*

The author was a representative of the Bureau of Fisheries and the investigation was made during nearly five months in 1914. The subjects of inquiry were the fisheries, the fur-seal industry of the Pribilof Islands and the minor fur-bearing animals.

It is strongly urged that the administration of the salmon industry remain under the Department of Commerce and Labor, and be not shared with territorial officers. The leading methods of catching are described and suitable restrictions are proposed. For years a controversy, interesting to physiographers, has gone on regarding what constitutes the mouth of a river. By a recent court decision the sites of markers must be determined at low water, a provision which protects the fish as they loiter about stream mouths preparatory to the ascent of the river for spawning. A closing date for catching is important, to avoid the taking of salmon in a deteriorated condition. The dates suggested vary with locality from August 10 to September 10.

* Report of Alaska Investigations in 1914. By E. Lester Jones. 155 pp. Map, ill. Bur. of Fisheries, Dept. of Commerce, Washington, 1915. 11 $\frac{1}{4}$ x 9 $\frac{1}{4}$.

Owing to growing local demand, some streams have been closed to commercial fishing, and it is advised that six other waters be thus restricted, including the Copper River, above its delta. Congress is also urged to prohibit all fishing within a half mile of a stream's mouth. Log jams should be removed and fish ladders constructed to aid the salmon in the ascent of some streams. There was found on Prince of Wales Island, below a fall, a place where thousands of salmon, tired out in their attempt to pass a fall, were thrown on shore by bears, which cast out many that they do not eat, and often eat the cheek and reject the rest of the fish. Other enemies of the salmon are wolves, eagles, gulls, terns, hair seals and sculpins.

The halibut industry is second to the salmon in Alaska and the supply is already showing depletion. This industry centers at Ketchikan. Cod fishing goes back to Russian occupation and can be extended. The herring industry is small but has large possibilities. Whaling is carried on from two shore stations, which have modern works and utilize the carcasses completely for oils, fertilizers and animal meal.

A patrol system is advised, with division of the 600,000 miles of territory into five districts. Under present conditions, one man is expected to patrol 100,000 square miles, or watch a shore-line of 5,000 miles. Suitable patrol vessels should be provided, in view of the \$20,000,000 of annual production, with a shore-line of 26,000 miles involved. Some flagrant violations of fishing laws are cited, as emphasizing the need of patrol work, and hatching activities are reviewed at some length.

The fur-bearing animals are also in urgent need of more protection, and bounties are advised on wolves and some other destructive animals. Comment is emphatic on the unjust effect of certain laws, on natives whose traditional occupation has been taken from them before they have learned any other. In discussing the Pribilof Islands, the author gives much attention to the social and economic conditions of the natives. This was in keeping with his instructions, the special investigation of the seals being largely committed to other agents. To meet the needs of the islands it is necessary to employ in the service of the government men of education and integrity, and this means adequate salaries and comfortable homes. There is need of medical, dental and hospital service, and suitable provision for supply ships should replace the present antiquated arrangements.

Among the prime needs of Alaska is the charting of the coasts, the building of lighthouses, and wire-drag operations for locating submerged rocks. Five hundred lives and \$8,000,000 worth of property form the wreck loss of recent years. Vigorous measures are required if the fishing trade of Alaska is not to fall away from the United States. Prince Rupert is not far away and the Canadian ports and railroads are eager for the business. The closing pages summarize under thirty-four heads, the recommendations of the report, which is generously illustrated by more than 200 views and sketch maps.

A. P. BRIGHAM.

GEOGRAPHICAL RECORD

NORTH AMERICA

A New Series of U. S. Geological Survey Index Maps. The index maps heretofore issued by the U. S. Geological Survey to show the extent and location of its published topographic sheets and geologic folios have been on the scale of 1:2,500,000, the scale of the standard base map of the United States, of which they were excerpts. Twenty-one such index maps, officially designated as "index circulars" and numbered from 9-323a to 9-323v, constituted the series, each index map generally covering a group of states.

A new series of index maps has now been begun of which the scale is 1:1,000,000 and in which practically every state is to be represented on a separate map. The new arrangement has been made possible by the recent compilation of the standard black-and-white base maps in 1:500,000 (see *Bull.*, 1914, pp. 203, 713-714, 955, and 1915, pp. 313-314). The new index maps are reductions of the state base maps with the usual red overprint indicating the limits of the published sheets and folios; a valuable innovation, made possible by the large scale, is the indication, besides, of the triangulation net and the primary traverse and level lines. Although to date 32 states have been published in the base-map form, only the following 14 states are so far represented in the new index map series in 1:1,000,000: Alabama, Georgia, Kentucky, Maryland and Delaware (on one map), Mississippi, New York, North Carolina, Pennsylvania and New Jersey (on one map), South Carolina, Tennessee, Virginia, West Virginia. It is the intention of the Survey, the Society is informed, to issue index maps on this scale when a reprint of an index circular becomes necessary and provided the base map of the state has been published. The new series receives an added interest from the fact that it makes available for certain sections of the United States maps on the millionth scale—in outline only, to be sure, with no indication of relief—before they can be had in the form of the International Map of the World. An edition of the new index maps without the red overprint would doubtless commend itself to geographers. On the millionth scale they would be only one-fourth as large as the 1:500,000 base maps (e. g., New York, 23 x 29 inches as against 46 x 58 inches), and therefore more convenient to consult, while hardly losing in legibility, because of the sharpness of line of the base maps.

Rainfall of the Northeastern United States. A discussion of the rainfall of the northeastern United States by B. C. Wallis (*Monthly Weather Review*, Vol. 43, 1915, pp. 11-14) presents a new series of charts of some interest. The rainfall for each month is shown by means of lines of equal departure from the rainfall norm. These lines are termed *equipluves*. The norm is the amount of rainfall that would occur at any place on the assumption that such rainfall was evenly distributed through the year. The norm is shown by the *equipluve* of 100. Differences from the norm are expressed in percentages. An *equipluve* of 120 means that the places through which it runs have 20 per cent. above the norm. It appears that "a wave of dryness moves southeastward during the period when the temperature is falling, from September to the end of January, and a wave of wetness moves southeastward during the period when the temperature is rising, from May to August."

A further discussion, by the same author, of the distribution of the rainfall of the eastern United States (*ibid.*, pp. 14-24) is illustrated by charts of *equipluves*, of wettest and driest months, and of rainfall regions, as well as by diagrams. This study leads to the conclusion that there are three rainfall belts: (1) a belt of summer rains and winter dryness, to the west and north-west; (2) a belt of rainfall at all seasons, intermediate in position; and (3) a belt of marked summer rains, along the Atlantic coast. The axis of all these belts is northeast-southwest.

R. DEC. WARD.

Transportation of Canadian Wheat. The Canadian wheat crop for the present year is estimated at over 200,000,000 bushels. It is believed that, during this season, there will be little or no congestion of traffic. The Canadian Northern, the Grand Trunk Pacific and the Canadian Pacific Railways have already assembled many thousands of cars in the West, and are continually sending more. Owing, however, to the present shortage of ocean tonnage available for freight service, much uneasiness is manifested as to the foreign shipment of the new wheat crop. This is but one feature of the export business of the country which has been hampered both by the shortage of vessels and by the high freight prevailing since the outbreak of the war. So important is the problem of foreign shipment of the wheat crop that the Canadian government, according to authoritative reports, has entered into negotiations to have released from war service some of the vessels which have been requisitioned since the outbreak of the war, and to have pressed into the wheat-carrying service every available tramp steamer. Only by some such action, it is believed, will congestion be prevented at the eastern water terminals.

A. L. BISHOP.

Promotion of Canadian Foreign Trade. A new effort to promote the export and import trade of Canada has been announced (*Commerce Reports*, Aug. 25, 1915). One of the leading Canadian banks will undertake to assist manufacturers and importers in collecting information about marketing conditions in other parts of the Empire. "The bank will make inquiries into the possibilities and requirements of markets abroad for exporters and importers who desire to extend their trade with British colonies or possessions. Owing to the large number of its correspondents and agents, it has unusual facilities for this work." The bank has 370 branches throughout the Dominion and in several of the leading British colonies, and is therefore in a position to assist in promoting a species of foreign trade which, for many years past, has received the attention of British and Canadian statesmen, economists and others, *viz.*, inter-Imperial trade. The carrying on of this kind of work by a banking institution, though a new departure in Canada, has for a long time been practiced successfully by some of the leading banks of Europe.

A. L. BISHOP.

Glaciers on Windward and Leeward Slopes. The Canadian Geological Survey has recently published two maps which show admirably the relation of snow fields and glaciers to windward and leeward slopes (Portland Canal Mining Area, Map 50A, accompanying *Memoir 32*, Department of Mines; Hazelton-Aldermere, Cassiar and Coast Districts, Map 136 A).

The area is in British Columbia. The glaciers of the Hazelton-Aldermere district are just south of the Grand Trunk Pacific Ry., which crosses the Canadian Coast Range by the canyon of the Skeena River. Just north of the Skeena, at the head of the Portland Canal fiord, are the glaciers of the Portland Canal mining area. This is in latitude 55° to 56° N., the coastal area being slightly north of the inland area. How much more snowfall is shed upon the windward or western slope of the Coast Range by the prevailing westerly winds is shown by the altitude of the glacier termini. In the Portland Canal region the Bromley Glacier extends down to less than 1,000 feet above sea level, while in the Hazelton-Aldermere region the largest ice tongues terminate 4,500 to 5,000 feet above sea level. Moreover, there are more and larger ice masses on the windward than on the leeward slope of the Coast Range.

LAWRENCE MARTIN.

The Nineteenth International Congress of Americanists. The Washington meeting of the Congress scheduled for October 5, 1914, was indefinitely postponed in consequence of the European war. Chairman W. J. Holmes recently announced that it is now deemed possible to hold a well-attended session of the Congress during the coming winter. The session will be held in Washington, December 27-31, when a number of other important scientific bodies will meet at the capital. The meeting will be held jointly or in cooperation with the Anthropological Section of the Pan-American Scientific Con-

gress, the American Anthropological Association, the American Historical Association, the American Folklore Society and the Archeological Institute of America. The programme previously published will for the most part be carried out excepting the field excursions.

CENTRAL AMERICA AND WEST INDIES

Conditions at the Panama Canal. On July 16 the battleships *Missouri*, *Ohio* and *Wisconsin*, of the U. S. Navy, passed through the Panama Canal and continued their cruise to San Francisco. Several minor warships of various powers had previously used the Canal, but this passage demonstrated its practical use in connection with the manœuvres of the American navy.

The slides in Gaillard Cut are still giving considerable anxiety and it will be six months before comparatively stable conditions will be obtained, with minor disturbances for several years to come. While I was on the Isthmus this summer, the largest ships were held up but one day, and that, strange to relate, due to a slide on the very day that Gen. Goethals announced in New York that the fleet could pass through. The records show, in the year that the Canal has been open to traffic, that the total delays due to all causes have amounted to less than three weeks with conditions steadily improving.

The only point at which trouble is experienced is in a 1,200-foot stretch immediately north of Gold Hill, the Continental Divide; and even were everything in sight to come down at once, the 300-foot bottom width of the canal and the extremely flat side slopes give such a margin of safety that it does not appear possible for any more than slight temporary troubles to take place. A marvelously organized dredging fleet is constantly at work with sufficient capacity to remove 750,000 cubic yards a month. JAMES GORDON STEESE.

San Blas Indians Losing Their Isolation. The north coast of the Republic of Panama from a point a few miles west of the Gulf of San Blas to Cape Tiburon on the Colombian frontier is occupied by the San Blas Indians. These Indians have preserved their independence and have successfully held their territory from foreign exploitation to the present time. Even the Isthmian Canal Commission had to make an agreement with them concerning sand deposits at Nombre de Dios. Their blood and racial characteristics have also been kept pure, and it is a fact that traders along the coast are forced to return to their ships at sundown and, even in the last year or two, a few venturesome prospectors have been escorted out of the country by the Indians.

The President of Panama made a special trip of conciliation to the San Blas coast this spring, but most of the Indian chiefs refused to receive him, and the trip was a failure. However, he did meet some of them and established a custom house on one of the islands in the Gulf, where all trading boats must clear. This will deprive the recalcitrants of many of their luxuries, and it is hoped they will come around eventually. But at present they are flying the Colombian flag, not in deference to Colombia, but in defiance of Panama. JAMES GORDON STEESE.

Hydrographic Survey of the Cuban Coast. During the Spanish-American War, the navigators of the United States fleet, on leaving our well-surveyed Atlantic Coast, came at once into West Indian waters where navigation was hazardous, because the coasts and anchorages had not been surveyed with sufficient accuracy to make it possible to provide good navigation charts. In some areas the coastal waters had scarcely been explored.

Our Hydrographic Office informs the *Bulletin* that among the survey operations conducted by our naval vessels since that time, none are more important than the coast survey of Cuba. This work was started soon after the founding of the Republic, with surveys of the harbors of Havana, Santiago, Guantanamo, Bahia Honda, Cabañas, Sagua la Grande, Nuevitas, Puerto Padre, Gibara, Banes, Nipe, Levisa, Cabonico, Tanamo, Baitiqueri, Hatibonico, Yateras River, Escondido, Daiquiri, Siboney, Nima-Nima, Chirivico, Ensenada de Mora (Pelón

Harbor), Niquero, Manzanillo, Santa Cruz del Sur and Cienfuegos. It was continued by the establishment of their geographical positions determined by a supplementary expedition equipped by the Navy Department to fix meridian distances by exchange of telegraphic signals. The work was later planned to include the whole coast of Cuba, and at present embraces the entire southern seaboard from Cape Maysi, at the eastern end of the island, stretching westward from Cape Cruz and Manzanillo, where emergent areas rising from moderate depths form the channels through which several of the important ports of Cuba are approached.

It is expected that during the coming winter these survey operations will be extended westward from Casilda across the mouth of the harbor of Cienfuegos and beyond toward the region of the Isle of Pines. The Cuban gunboats *Habana* and *Diez de Octubre*, which rendered valuable service last winter in supplementing the work of our own survey expedition, will continue this needful work, which is so important for the commercial and military interests of Cuba.

SOUTH AMERICA

Professor Bingham's Latest Expedition. Professor Hiram Bingham, of Yale University, (Director of the Peruvian Expedition of 1914-15, under the auspices of Yale University and the National Geographic Society), returned early in September from this, his fifth expedition to South America. His latest work in Peru was conducted in the same general region as his two preceding explorations—the Apurimac and Urubamba Valleys, and the adjacent divides. Mr. Orator F. Cook, Chief of the Office of Crop Acclimatization, Department of Agriculture, and his assistant, Mr. Gilbert, returned with him. They were very successful in their search for new plants and ancient food plants, and brought home several thousand specimens.

The naturalist, Mr. Edmund Heller, who expects to return late in October, has collected about 1,000 specimens of mammals and birds, which will go to the United States National Museum. Chief Assistant Hardy, who also returned with Professor Bingham, is accompanied by a Quichua Indian, of whom he is learning to speak the native language, the modern form of the Inca tongue. Three other members, Surgeon Ford, and Engineers Hasbrouck and Maynard, are to remain in Peru until late this year. The Archaeological Engineer of the Expedition, Mr. Ellwood C. Erdis, is now on his way to this country. The *Bulletin* expects to publish a summary account of the most important archaeological and geographical results of Professor Bingham's 1914-15 Expedition.

AFRICA

Area of German East Africa. Recent measurements by H. Böhler on the standard map of the colony by Sprigade and Moisel on the scale of 1:300,000 have resulted in the determination of the area of German East Africa as 997,145 sq. km., with a limit of error of ± 200 sq. km. This is the equivalent of 409,691 sq. miles, or, in round numbers, 410,000 sq. miles—about the combined area of Texas, Oklahoma and Kansas. In this figure are included the German portions of the Central African lakes, as follows: Tanganyika, 16,070 sq. km.; Nyasa, 5,640 sq. km.; Victoria, 34,360 sq. km.; Kivu, 930 sq. km.—a total of 57,000 sq. km. (*Mitt. aus den Deutschen Schutzgeb.*, Vol. 27, 1914, No. 1, p. 80).

ASIA

Sir Aurel Stein in Central Asia. The *Geographical Journal* (August, p. 154) gives further information of the work of this explorer. He accomplished [later than November, 1914], with complete success, a long desert journey from Turfan, though the ground and the climatic conditions were trying, potable water was scarce and icy winds were experienced daily. With the aid of his two survey assistants, traveling by different routes, large areas in the "Dry Mountains" hitherto little known were mapped. The exploration of the ancient bed

of Lop Nor was completed. The earliest Chinese route in Central Asia has now been traced throughout and all its ruined watch-stations and cemeteries searched for antiquities. Since the winter of 1913-14 the Indian triangulation net has been carried from the main Kuen-lun across the Lop Desert as far north as the Tien Shan, thanks to the persistency of Sir Aurel's old companion, Lal Singh. Sir Aurel himself examined the old sites about Kucha, interesting in connection with the diminished water supply within historic times. A careful study of modern conditions of irrigation is much needed and there is a large field open for an irrigation engineer in all the oasis. Sir Aurel obtained permission from the Russian authorities to travel during the summer of 1915 in the mountainous tracts north of the Oxus. He hoped thus to see an historically interesting region, one part of Bactria, and to reach Seistan in the autumn. Here he would have the opportunity for a specially interesting study of the remains and physical conditions of a miniature edition of the Lop Basin. The traveler's safe arrival at Kashgar has since been reported.

AUSTRALASIA AND OCEANIA

Central Australia and Its Possibilities. Mr. W. H. Tiekens, in a paper read at the Australian meeting of the British Association last year, said that Central Australia (between $24^{\circ}20'$ S. and $30^{\circ}35'$ S. and 123° and 133° E.) embraces an area of about 378,000 square miles, considerably greater than the area of New South Wales. This immense area is a sandy depression, in places perhaps not much above sea-level, where the sand-hills or sand-dunes in some instances may be 100 feet high. It has been called the "Dead Heart of Australia."

So much has been done in reclaiming these so-called desert tracts in other countries that, in Mr. Tiekken's opinion, it would be well to turn attention to this enormous area in Australia. The sand-hills occur in confused groupings, also in nearly parallel ridges, but these do not prevail west of 127° E. long. To the west, with few exceptions, the country is more level, the soil is hard loam, with nodules of iron-stained gravel, robust vegetation, spinifex, desert oak, and other plants. The purpose should be to ascertain where irrigation may be carried on, which will in time develop and make profitable what has hitherto been regarded as desert waste.

Possibilities are suggested, he says, from the fact that native wells are sometimes the remains of mound springs. These springs are the natural outlet of artesian waters, and from that it would seem that the artesian basin may here be nearer the surface than has hitherto been observed in Australia.

The Trans-Australian Railroad. A recent report of the Chief Commonwealth Railroad Engineer gives some details of the progress of construction of the east to west transcontinental railroad of Australia. It says that the Western Australian Division survey is complete and the route has been permanently located to 280 miles. The South Australian survey is complete. It is predicted that the rails will be laid throughout before the end of next year, although the rate of progress will be reduced by the very heavy earthworks soon to be taken in hand in the South Australian section. During the three months preceding the date of the report, 240 miles had been laid. The line is to be ballasted throughout, and arrangements have been made to select quarry sites and erect the necessary plant for rock-crushing. In view of the scanty water supply on the route, reservoirs had to be provided at various points and several are in course of construction. (*Geogr. Journ.*, Vol. 46, 1915, No. 2, p. 157.)

EUROPE

Pseudo-glacial Features in Dalmatia. Professor J. W. Gregory of the University of Glasgow has contributed an article under the above title to the *Geographical Journal* for August (Vol. 46, 1915, pp. 105-117) which forms a fitting supplement to his recent volume on the "Nature and Origin of Fiords."

In that volume he rejected the origin of firds by glacial erosion, and ascribed them chiefly to fractures and normal erosion. In the present article, he sets up a straw man and then bowls him over: that is, he describes "hanging valleys, truncated spurs, oversteepened slopes, overdeepened valleys, spurless walls, trough valleys, and rounded subdued relief" in Dalmatia, all of which have elsewhere been taken as giving indirect evidence of glacial action; he then shows that Dalmatia has not been glaciated, except in its higher mountains; and thereupon concludes that the above Dalmatian features "are not due to glacial erosion." There can be no question that his conclusion is correct; but it would seem hardly necessary to give so elaborate a disproof of anything so absurd as the counter supposition; for who believes that those Dalmatian features are of glacial origin? The real inwardness of the article seems to be left unexpressed—namely, as the above-named features are not of glacial origin in Dalmatia, they are not of glacial origin anywhere else.

There is a curious lack of critical discrimination in Gregory's article. He instances "valleys with spurless, parallel walls," but says nothing as to how far their forms are dependent on strong and weak structures; one example in which both sides are spurless, "would pass as an excellent example of an ice-worn trough-valley" in the Appalachians of Virginia, but as they are manifestly subsequent valleys of normal erosion, excavated on weak strata between enclosing harder strata, no one has ever, to my knowledge, confused them with glaciated troughs. The walls of the lower valley of the Kerka are said to be "as smooth and spurless as those of a Scottish glacier-worn glen"; but the Kerka valley is a young gorge eroded by a large river in a limestone peneplain; it is spurless because it is young. As to "rounded subdued relief," forms of that kind prevail wherever normal erosion has worked long enough without interruption: hills of drumlin-like form occur in certain parts of Pennsylvania, but they have been normally worn down on belts of shale.

On the other hand, there is a certain "fool-killer" value in Gregory's discussion; it may help to discredit the work of careless observers, who mistake every rounded granite boss, every truncated spur, every hanging valley, every ria, for the work of glacial erosion; but it is a question whether such observers are numerous enough, or their work important enough, to make it worth while to follow them up and destroy them. Inasmuch as it is well known that rounded bosses and truncated spurs, hanging valleys, and steep-sided rias may be produced by normal erosion as well as by glacial erosion, it would be profitable to consider the means of discriminating between such imitative forms; but this Gregory has not done, either in the present article or in his earlier work. It is because of his failure to make such discrimination that he does not include glaciers as strong erosive agencies.

W. M. DAVIS.

A Map of Europe on the Scale of 1:1,000,000. The Royal Geographical Society of London publishes, in the July and August numbers of the *Geographical Journal*, a paper by its Secretary, Mr. A. R. Hinks: "The Map on the Scale 1:1,000,000 Compiled at the Royal Geographical Society under the Direction of the General Staff, 1914-1915" (Vol. 46, 1915, No. 1, pp. 24-50, No. 2, pp. 140-145, with maps). The paper describes the compilation and publication of a new map of Europe on the scale of 1:1,000,000. The war created a demand for a general, yet sufficiently detailed map suited to a study of the broader problems of military strategy and politics. None of the existing series of war office maps, of which instructive index diagrams are given in Mr. Hinks's paper, covered the whole area; their use, therefore, would have necessitated the very adjustment to differing scales and methods of treatment which would have prevented all attempts at broad generalization. The same is true of the maps in a standard general atlas, such as Andree's *Handatlas*, for the European maps of which a suggestive diagram is also given, showing the extent and scale of each plate. Of the International Map of the World, whose scope would have made it very suitable, only a few isolated sheets had been published prior to the outbreak of the war.

It was therefore decided to prepare a map which would be the best equivalent that could be made at short notice of what the International Map would have

been if it had been available. All of the essential requirements of the International Map have been retained, both as to subdivision of sheets and selection of elements represented, although some modifications had to be made. The work was begun in September, 1914; the high pressure under which it has been done is attested by the fact that no less than twelve sheets have been published to date (N-32, Hamburg; N-33, Berlin; N-34, Warsaw; M-32, Frankfurt; M-33, Vienna; M-34, Cracow; M-35, Jitomir; L-32, Milan; L-33, Trieste; L-34, Budapest; K-33, Rome; K-34, Sofia). The sheets were compiled by the Royal Geographical Society and are published by the Geographical Section of the General Staff, of whose agents they may be purchased at one shilling each. Other sheets, including six to cover Asia Minor, are to follow.

An examination of the twelve published sheets, sent to the Society by the Royal Geographical Society, gives an insight into the astounding amount of work accomplished by those concerned in their preparation. Sheets that ordinarily would have taken at least a year to publish have been issued at the average rate of one a month. The necessity for speed has demanded and received a critical restriction to essentials; for this reason the maps are all of an eminently workable nature. The general effect of the map is to bring out prominently roads and railroads on a subdued, yet perfectly legible, background of relief and drainage. Roads are shown in full red lines; three classes are distinguished. First-class roads thus stand out much better than if drawn according to the International Map regulations, which required two thin parallel lines. The symbol for railroads has also been changed, a solid black line being used for two-track lines, instead of the cross-tie symbol advocated by the London conference of 1909. Two other classes of railroads are distinguished: single-track and narrow-gauge.

Relief is represented in brown contours: the contours selected differ from those prescribed either at the London or the Paris (1913) Conference. The former prescribed a contour interval of 100 meters or, in the case of very rugged country, 200, 500 or 1,000 meters. The latter made obligatory the contours of 200, 500, 1,000, 1,500, 2,000, 2,500, 3,000, 4,000 meters, etc. The present map shows the 100 and 200 meter contours and, above, every contour at an interval of 200 meters, in the laudable belief that a change in the contour interval on higher ground creates misconceptions as to the topography. This is doubtless more particularly the case where the contours are unsupported by hypsometric tints, as with the present map. The absence of hypsometric tints is, indeed, the main factor which differentiates in appearance the present map from the published sheets of the International Map. The present issue is termed a provisional edition; in a second edition it is intended to use a simplified color scheme of two green tints below 200 meters and three orange-brown tints above. In the representation of drainage a valuable innovation has also been made, in that the larger river channels are shown in solid blue; this brings such rivers as the Danube into their proper prominence, instead of suppressing them, as did the International Map. Various other innovations may be mentioned: Boundaries are not shown by black crosses, but by violet dots, giving greater flexibility and transparency; the names of larger areas are not shown on the main map, but in a small index diagram on the margin of each sheet, thus doing away with the unsynoptical nature of widely spaced lettering. The orthography of names has received special attention and has been solved in this way: All names in languages using the Latin alphabet have been retained in their original form, the difficulties in pronunciation in such languages as Polish, Czech, Hungarian, Rumanian, etc., being overcome by appending on each related sheet a brief pronouncing key. Names in languages not using the Latin alphabet have been transliterated.

These are only some of the features that received thorough consideration before embarking on the preparation of the map. The decisions arrived at reflect throughout a wise flexibility which has made for practicableness while insuring at the same time a high standard of scientific excellence. That all this has been attained in the space of less than a year shows that, in England, geography has risen to its country's call in her hour of need.

GENERAL

A History of Paleogeographic Maps. In a recent paper (Zur Geschichte der paläogeographischen Rekonstruktionen, *Geogr. Zeitschr.*, Vol. 20, 1914, pp. 197-208) T. Arldt gives a chronological review of all past attempts to represent the distribution of land and water in former geological ages. The nature of the subject is responsible for the fact that these reconstructions are best made in graphic form, and Dr. Arldt's paper therefore necessarily mainly refers to maps. The science of paleogeography dates from the middle of the nineteenth century. Some of the earliest reconstructions were the maps accompanying the first edition of Dana's *Manual of Geology* in 1863. Prior to 1885 most reconstructions dealt with a relatively limited area. M. Neumayr was the first to attempt to reconstruct the distribution of land and sea for the whole earth; an added merit of his method was that he restricted himself to a definite subdivision of a geological epoch (Jurassic), while previous representations had dealt with whole epochs or systems, and that he recognized the existence of climatic zones in the geological past. In its revised form, as published in his *Erdgeschichte* in 1886-87, it became widely known. With the publication, in 1900, of the fourth edition of his *Traité de Géologie*, de Lapparent began the series of world maps which have made his manual the standard compendium of paleogeography. In the last, fifth edition, of the book (1906) there are no less than 23 world maps (in stereographic as compared with Mercator's projection in the fourth edition), 34 maps of Europe, 25 of France, and 10 others reproduced from other writers. The most important paleogeographic maps relating to North America are those published in Chamberlin and Salisbury's *Geology* (Part II: Earth History, Vols. II and III) and in Schuchert's fundamental paper entitled "The Paleogeography of North America" in the *Bull. Geol. Soc. Amer.*, Vol. 20, 1910, pp. 427-606.

PERSONAL

Prof. Giovanni de Agostini, the founder and director of the Geographical Institute at Novara, Italy, has been elected an Honorary Member of the Royal Geographical Society of Rome.

Prof. Eduard Brückner has been elected President and Prof. Eugen Oberhummer Vice-President of the Vienna Geographical Society.

Dr. Nevin M. Fenneman, Professor of Geology at the University of Cincinnati, will have a year's leave of absence in 1916-1917.

OBITUARY

ANDREW J. HERBERTSON. Through Professor Herbertson's death, to which brief allusion was made in the September *Bulletin*, geography in England and, indeed, in all English-speaking countries, loses one of its ablest exponents. His has been no small share in the advance of geography in England during the last thirty years. Appointed Reader in Geography at the University of Oxford in 1905 as the successor of Mackinder, and Professor in 1910, he has probably exerted a greater influence on the teaching of geography in England than any other man. His editorship of the *Geographical Teacher* afforded him an additional medium of expression and influence. His interest in the methods of geography was markedly developed—a fortunate circumstance in one called upon to coordinate and systematize a subject and impart its essentials to others. Probably his most notable contribution in this field was his work on the natural regions of the earth. Using the elements of relief, climate and vegetation as criteria, he devised a scheme of subdivision of the earth into a number of units whose physical characteristics were essentially homogeneous.

The study of climate, because of its influence on life, had always appealed to him as of fundamental importance; several of his most important contributions, such as "The Distribution of Rainfall over the Land" (1901) and Bartholo-

mew's "Atlas of Meteorology" (joint author, 1899) belong to this field. Among his best-known text books are the "Preliminary, Junior, and Senior Geographies" belonging to the series of Oxford Geographies, to which, under his editorship, others have contributed important volumes. He also published the Oxford series of wall maps, in which the British Isles, the continents and the world were each represented by a set of maps showing the relief, rainfall and vegetation. His recent "Handbook of Geography" (1911-12) aims to supply the long-felt want of a work intermediate between the ordinary elementary school geography and such a standard work of reference as Dr. Mill's "International Geography." A similar recent undertaking for a restricted portion of the globe is the "Oxford Survey of the British Empire," of which he was editor. In his "Man and His Work" (1899), finally, Herbertson gave us an admirable popular presentation of the principles of anthropogeography.

GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

BOOK REVIEWS AND NOTICES

(The size of books is given in inches to the nearest half inch)

NORTH AMERICA

Nature and Science on the Pacific Coast. A guide-book for scientific travelers in the west. Edited under the auspices of the Pacific Coast Committee of the American Association for the Advancement of Science. xiii and 302 pp. Maps, ill., index. Paul Elder & Co., San Francisco, 1915. $7\frac{1}{2} \times 5$.

The contributors of papers on the earth studies in our Pacific Coast region are: Alexander McAdie: Weather Conditions; Ruliff S. Holway: Physiographic Geography; C. F. Tolman, Jr.: Geology of the West Coast Region; J. C. Branner: Earthquakes; H. Foster Bain: Mines and Mining; Ralph Arnold: Petroleum Resources and Industries; George F. McEwen: Oceanic Circulation and Temperature; LeRoy Abrams: The Deserts and Desert Flora; E. J. Wickson: Agricultural Development; Joseph N. LeConte: Mountaineering.

History, Fauna, Flora, Ethnology, Astronomical Observations, Museums, Irrigation, Chemical Resources, Scenic Excursions, and other topics are treated by equally authoritative writers. The book should be a boon to all intelligent readers generally as well as to "scientific travelers in the West." Readability characterizes the entire content; and all the half-tone plates, and the insert and folded maps and plans are very helpful. There are folded plans of Portland, Seattle, Puget Sound, San Francisco, west-central California, Los Angeles, San Diego and Salt Lake City, with larger geological maps of California and the life zones of that state.

The French in the Heart of America. By John Finley. x and 431 pp. Index. Charles Scribner's Sons, New York, 1915. \$2.50. $8\frac{1}{2} \times 6$.

Records lectures given by the author at the Sorbonne and in several provincial cities of France, as exchange professor on the Hyde Foundation. The aim is to revive for the French the traditions of Gallic life in America.

That the historical sketches follow in some degree a geographical plan is plain from the titles of many of the chapters, of which we find such examples as, "From Labrador to the Lakes," "In the Trails of the Coureurs de Bois," "Western Cities that have sprung from French Forts," and a similar treatment of origins as related to the portage paths in Wisconsin, Illinois and Indiana.

The author writes as a lover of the land of his birth, the prairie country of Illinois, and as portraying the "Valley of Democracy" against the romantic background of its finding and its early history. The pen moves under the inspiration of Parkman, breathed in college days, and full debt is registered in the epilogue, which is a tribute to the great historian. The style is free and popular, uniting gossip sketches with fragmentary but interesting geographical descriptions. It is a good vacation book, serious but not exacting, and looking at it with a school teacher's inquiry, it offers supplementary furnishing for geography and history. This is nowhere better shown than in the chapter "The River Colbert" (Mississippi), as one is led from LaSalle and Marquette to Mark Twain, Hamlin Garland and the National Waterways Commission.

The volume is not systematic history nor scientific geography, but only what it confesses itself to be; and one who finds in it many things of common knowledge should remember that the book was written and spoken primarily in France and for the French people.

A. P. BRIGHAM.

The Bird Book. Illustrating in Natural Colors more than 700 North American Birds; also Several Hundred Photographs of Their Nests and Eggs. By Chester A. Reed. 471 pp. Index. Doubleday, Page & Co., New York, 1915. \$3. 10 x 8.

This volume is typographically and artistically one of the best that the reviewer has seen. Seventeen orders and more than 700 kinds of North American birds are comprehensively described. Most of these are splendidly illustrated in their natural colors, with photographs of their nests and eggs. Many other photographs show characteristic habitat groups. The typography of a bird is given on a frontal page, thus very materially assisting amateurs to an understanding of any technical terms used in descriptions. Combined with the splendid coloring, this establishes the book as one that amateurs may well use. All bird lovers should have a copy on their shelves. The descriptions include both common and scientific names, ranges, breeding habits, feeding and other habits, details of size, materials and other characteristics of nests, color markings, and size of eggs. The orders and families of birds also receive adequate treatment.

R. W. SHARPE.

United States: Colonies and Dependencies. The travels and investigations of a Chicago publisher in the colonial possessions and dependencies of the United States. By William D. Boyce. xvi and 638 pp. Maps, ill., index. Rand McNally & Co., Chicago, 1914. 9 x 6.

A western newspaperman's story of his personal investigations of those peoples upon whom our nation has exercised its national influence. His survey takes in Alaska, Hawaii, the Philippines, Porto Rico, the Canal Zone, Cuba, Santo Domingo and Haiti. Throughout, the newspaperman's art of getting at the facts through personal interviews with people on the spot is in evidence. It is asserted that the laws governing railroads and homesteads in Alaska are such as to retard the growth of the country. It is maintained strongly that the abandonment of United States sovereignty in the Philippines would be unwise and unjust and that it will be several generations before Porto Rico can be fully incorporated. Numerous high-class reproductions of the camera embellish the book.

In the Oregon Country. Out-Doors in Oregon, Washington, and California together with some Legendary Lore, and Glimpses of the Modern West in the Making. By George P. Putnam. xxi and 169 pp. Ills. G. P. Putnam's Sons, New York, 1915. \$1.75. 8 x 5½.

Enthusiasm for the Westland is the apology and motive for this breezy and natural account of personal experiences, canoeing, camping and "hiking" over the hinterland of Oregon. Theodore Winthrop's "Canoe and Saddle" is quoted for Indian legends of mountain and river. The ups and downs of homesteading in the sage brush lands opened by the government to settlers are pictured with realistic pathos. Those who are fond of "back-to-naturing" will enjoy reading this simple and unaffected narrative of actual contact with homely folk in the far west, and of the enjoyment of outings in the open air of Oregon. The Governor of the state writes an appreciative introduction. The reproductions of camera views are the best of their kind.

Missouri River Basin. By W. A. Lamb, Robert Follansbee and H. D. Padgett. Part 6 of Surface Water Supply of the United States, 1912. 375 pp. Ills., index. U. S. Geol. Surv. Water-Supply Paper 326. 1914. 9 x 6.

The Missouri River is considered navigable to Fort Benton, Montana, 2,285 miles above its mouth. Above Fort Benton for 49 miles to Great Falls the river consists of falls and rapids with an aggregate drop of 695 feet. The 217 miles above Great Falls to Three Forks, where the Jefferson, Madison and Gallatin Rivers form the Missouri, are navigable, but several power dams have broken the continuity of this waterway. Numerous pools and bars make low water navigation uncertain and a large number of snags make it hazardous. The maximum draft at mean low water from the mouth of the river to Kansas City is 4 feet,

from Kansas City to Sioux City 3 feet, and from Sioux City to Fort Benton 2 feet. Up to June 30, 1913, the government had spent over \$14,000,000 on the river. Work on the removal of snags began in 1838 and has been continued at intervals since. Most of the money has been used to prevent bank erosion in local areas, to protect private property from the ravages of the river and in surveying. Engineers generally agree that the possibility of regulating the river so as to make it a channel of commerce has been demonstrated; that the cost of such regulation will be great; and that a general and not a piecemeal policy must be adopted. The data given in this volume demonstrate the wastefulness of a policy which spends money to improve any section of the river as a unit independent of the remainder.

ROBERT M. BROWN.

The Tourist's Maritime Provinces. With chapters on the Gaspé Shore, Newfoundland and Labrador and the Miquelon Islands. By Ruth K. Wood. 440 pp. Maps, illus., index. Dodd, Mead & Co., New York, 1915. 7½ x 5½.

A guide to Nova Scotia, Newfoundland and New Brunswick which enriches the handbook by a great deal of tradition, history and romance. The history of the various towns comprises the bulk of the volume, but everywhere along the route the author indicates the points of interest and the tourist's attention is directed to the characteristics of the land and the people. ROBERT M. BROWN.

The Indian To-day. The past and future of the first American. By Charles A. Eastman. (The American Books.) 185 pp. Doubleday, Page & Co., New York, 1915. 60 cents. 7½ x 5.

The author's father was a full-blooded Sioux and his mother a granddaughter of a Sioux chief. He has recently been employed by the U. S. Indian Bureau to give permanent family names to the Sioux. In 1911 he represented the American Indian at the Universal Races Congress held in London. That he is thoroughly qualified to write this book becomes at once quite evident.

The volume is divided into 11 chapters, an interesting bibliography and a table of Indian Reservations. It is the aim of the book "to set forth the present status and outlook of the North American Indian." It is an excellent exposition of the evolution of Indian affairs since the days of early settlement.

A few striking statements are worth noting. "The two great 'civilizers' were whiskey and gunpowder . . ." "The appropriation for 1915 was over \$4,500,000, yet even more is needed." "The value of crops raised by Indians during the last fiscal year is estimated at more than four millions." "In a word, the typical red man of to-day is a rancher on a large or small scale." "Half our states have Indian names, and more than that proportion of our principal lakes and rivers."

EUGENE VAN CLEEF.

CENTRAL AMERICA AND WEST INDIES

Old Panama and Castilla del Oro. By Dr. C. L. G. Anderson. xv and 559 pp. Maps. The Sudwarth Co., Washington, 1911. 9½ x 6½.

An entertainingly written account of the golden age of Spanish discovery and conquest in the New World, prepared by a surgeon of the Medical Reserve Corps of the United States Army, and late physician to the Isthmian Canal Commission. The well-worn story of Spanish conquistador and British buccaneer lends itself readily to the telling and the reader will follow with pleasure the description of the geography of the Isthmus of Panama, the narrative of the dream of Columbus, the four voyages which he made to America, the exploits of the other conquistadors, among them Balboa and Pizarro setting out from Panama for the conquest of Peru. Early descriptions of Panama, based on original documents, follow, and the search for a strait then supposed to exist, from the Atlantic to the Pacific, as well as early attempts to cut a canal. The famous Sir Francis Drake then steps upon the scene and the buccaneers of the Spanish Main follow in his footsteps. Then Henry Morgan, the foremost of buccaneers, again sacks Panama and the Scotsmen found their ill-starred colony

on the Isthmus of Darien. By way of appendix is added an English version of the curious bull of Pope Alexander VI, of May 14, 1493, bestowing on the Spanish Crown all lands to the west of a meridian drawn 100 leagues west from "any of the islands commonly called Azores" and unoccupied by any other Christian power on Christmas of 1493, and threatening "any man who rashly presumes to infringe" this Papal donation "with the indignation of Almighty God and His Holy Apostles Peter and Paul." This is called "the first diplomatic document of American history."

The Panama Canal: Comprising Its History and Construction, and Its Relation to the Navy, International Law and Commerce.

By Reuben E. Bakenhus, Harry S. Knapp, Emory R. Johnson. xi and 257 pp. Maps, diagrams, index. John Wiley & Sons, New York, 1915. 9 x 6.

Mr. Bakenhus, Civil Engineer in the U. S. Navy, is the author of Parts I, II, and III (about one-half of the volume), in which he gives the history of the canal projects, the physical characteristics of the canal region, the plan of the work, its construction and cost, problems of sanitation, etc. Parts IV and V, about 80 pages, were written by Capt. Knapp, U. S. Navy, who considers the effect of the canal upon our navy, and its bearing upon international law. Part VI, on the commercial importance of the canal, was prepared by Professor Johnson. An appendix contains President Wilson's proclamation of Nov. 13, 1914, prescribing "Rules and regulations governing the use of the Panama Canal by vessels of belligerents and maintenance of neutrality by the United States in the Canal Zone."

The material was originally published as a series of articles in the Proceedings of the United States Naval Institute. The authors have performed a noteworthy service by systematizing the data so as to present, from a comprehensive viewpoint, "the important principles, laws, and facts to which the canal owes its existence."

AVARD L. BISHOP.

SOUTH AMERICA

Landeskunde von Chile (República de Chile). Von P. Stange. (Sammlung Götschen). 116 pp. Map, ills., index. G. J. Götschen, Berlin, 1914. 90 pfg. 6½ x 4½.

There is somewhat more of the gazetteer and encyclopedia style of writing and thinking than we would like to see. Most of the earlier volumes in this admirable series kept clear of so natural a fault when the space is strictly limited. The result of the method is to leave little room for new facts and none at all for distinctive treatment. However, the facts are up-to-date and the condensation of material is always judicious. Within these limits it is a creditable and useful book. The photographs are representative and the map is good.

Argentina, Past and Present. By W. H. Koebel. 2nd edit. xx and 465 pp. Map, ills., index. The Macmillan Co., New York, \$5. 10 x 6½.

A readable book, supplying much information about what one sees in journeying about the republic. The account of Buenos Aires and its luxury are admirable, that of the meat-eating gaucho is good. Mr. Koebel gives the best account of the plague of locusts that we have seen, substantially a fearful loss now and then to rather limited districts, but not ever affecting seriously the harvest of the whole nation. Mutual insurance would appear to meet the losses perfectly.

The book covers the country with unusual completeness, except for the northwest, Jujuy, Salta, Santiago, Tucuman, Catamarca, La Rioja and San Juan. Mendoza and Córdoba are mentioned, but form no significant part of Koebel's Argentina. They have not felt the modern impulse of immigration and expansion so powerfully as the eastern provinces, but they do still preserve the old Argentine type of culture which dominates the nation, for all the Porteño veneer of extravagant luxury.

An account of the wheat-growing Italian and his economics might well have

been inserted at the expense of the historical matter. Koebel gives impressions of solid growth made and more and more to come. He does not generally supply much detail. You read of the rails across the Andes and their significance with no mention of the three different gauges.

The book has good notes of travel along the main lines of river and rail. We see the Jews of Basavilbaso actually rounding up cattle or tilling the soil and would like to know more of the colony. A stranger note, but one that all residents in the country recognize only too well, is the picture of the English loafer looking for work he does not want to do, more striking for the fine army of Englishmen filling all sorts of positions of responsibility. The pictures are fine, except those in color.

MARK JEFFERSON.

The South American Year Book and Directory, 1915. Containing general information relating to the ten republics of South America, British, Dutch, and French Guiana, the Panama Canal, the Falkland Islands, and Trinidad. 848 pp. Maps, ill., index. Louis Cassier Co., Ltd., London, 1915. 10½ x 7.

This new publication, now in its second year, contains the latest data relating to the ports, railroads, industries, and other business interests of each of the South America countries. The present issue also supplies much commercial, political and general information, special articles on Colombia, Ecuador, Peru and Venezuela, fifty-six maps chiefly of railroads and many half tone illustrations. The Year Book has already taken its place among the best sources of the latest facts concerning South American activities.

The Plateau Peoples of South America. An essay in ethnic psychology. By Alexander A. Adams. 134 pp. Ills. G. Routledge & Sons, Ltd., London. E. P. Dutton & Co., New York, 1915. \$1.25. 7½ x 5.

Although Mr. Adams calls his little book an essay in ethnic psychology, it is quite uncritical. He lightheartedly heaves up the Andes 4,000 or 5,000 feet in the last 12,000 years to account for the degeneration of the Bolivians, without so much as a mention of shore lines at that elevation as things worth looking for. Cause and effect are not related nor is logic appealed to. Quite as lightheartedly he makes his first Inca a Chinaman. He gets these things out of other books, of course, but that does not help us to believe in them. On the other hand, Mr. Adams has been in Bolivia, has used his eyes well and describes admirably the present whites and Indians, and Bolivian society and institutions. Even here it is a pity he has no sympathy with his people. A geographer will gain distinct power if he starts with the thesis that no people is without good points. Apart from this, many chapters of description are excellent. The four photographs are very fine, especially the two Indian types. MARK JEFFERSON.

The Lower Amazon. A narrative of explorations in the little-known regions of the state of Pará, on the Lower Amazon, with a record of archeological excavations on Marajó Island at the mouth of the Amazon River, and observations on the general resources of the country. By Algot Lange. xxv and 468 pp. G. P. Putnam's Sons, New York, 1914. \$2.50. 8 x 5½.

This is chiefly a narrative of three trips in the eastern portion of Amazonia. On one expedition the author ascended the Tocantins River for some distance. Another time he went up the Moju River, and above the falls encountered Indians with whom he lived, alone, for a week. They treated him as a friend and he learned something of their mode of life, customs, and language. Later he ascended the Arary River to Pascoval Island, and made a collection of ancient pottery.

Lange tells of the general living conditions and the people of the states of Pará and Amazonas. He writes that "practically the whole of the Amazon Valley has reached a stage of lamentable retrogression and poverty" due to depression in the Brazilian rubber industry. He considers agriculture the basis upon which the country will build its future prosperity, and points out how great the natural opportunities are if adequately handled.

WILBUR GREELEY BURROUGHS.

AFRICA

My March to Timbuctoo. By General Joffre. With a biographical introduction by Ernest Dimnet. 169 pp. Map. Duffield & Co., New York, 1915. 75 cents. $7\frac{1}{2} \times 5$.

In 1892 Major Joffre of the French army (36 years old) was sent to French West Africa to superintend the building of the railroad from Kayes, at the head of navigation on the Senegal River, to Bammako on the Niger. Long before Major Joffre had completed his task he was ordered to lead a military force up the west side of the Niger to take possession of the country and to assist Col. Bonnier, who had entered Timbuctoo, but, five days later, was killed by the Tuaregs, with 11 of his officers. No one knew this till Joffre heard it when approaching the famous town; so he hurried on to Timbuctoo, trounced the Tuaregs till he was triumphant and established so firmly French supremacy over Timbuctoo and that whole part of French West Africa that it has never since been in jeopardy to this day.

In this book he tells the story of that northern march and of the strenuous work at the end of it; all with such brevity and clearness that the reader is reminded of the style of Cæsar's Commentaries. It was his first great opportunity. On the border of the Niger he unconsciously paved the way for the steady advancement that came to him, till now he is the supreme commander of the French forces in the present conflict.

The introduction in 48 pp. is a well-written account of Joffre from his boyhood up. The chief impression it conveys is that, as boy and man, he was never showy, never scheming, but rose from place to place only as he was called to higher service by demonstrated capacity to fulfill its duties.

Wild Game in Zambezia. By R. C. F. Maugham. xii and 376 pp. Map, ills., index. Charles Scribner's Sons, New York, 1914. 9 x 6.

In this hunter's guide the material has been so carefully arranged that the book may be used as a fairly comprehensive text of the fauna of Zambezia. The author has largely subordinated his own exploits, but his book will be helpful to other seekers of wild game; and the public will find the work a good source book of original observations not only on the big game but also on the reptiles, birds and insects of the region. Considerable detail is given of the habitat, food and noteworthy and special characteristics of each animal and of the indications in any locality of the presence of animals. Accounts of insect pests include a chapter on the tsetse fly. General advice concerning equipment and conduct is given.

ROBERT M. BROWN.

The Rediscovered Country. By Stewart E. White. vii and 358 pp. Map, ills. Doubleday, Page & Co., New York, 1915. \$2. $8\frac{1}{2} \times 5\frac{1}{2}$.

The rediscovered country is a virgin game field along the boundary line between British East Africa and German East Africa between Lake Natron and Victoria Nyanza. The author gives a most readable account of his adventures. The appendices include a guide for the novice, a brief annotated list of game and a discussion of the mooted question of animal coloration.

ROBERT M. BROWN.

Im Hochland von Mittel-Kamerun. Von Franz Thorbecke. I. Teil. 101 pp. Map, ills. *Abhandl. Hamburg. Kolonialinst.*, Vol. 21 (Reihe C, Vol. 1). L. Friederichsen & Co., Hamburg, 1914. $11 \times 7\frac{1}{2}$.

Unfamiliar ground was opened to knowledge by Dr. Thorbecke's expedition into the unexplored highlands of Kamerun. He found that the hills establish a difference in climate which provides a sanitary change from the unwholesome conditions at Duala and other settlements on the coast. Dr. Thorbecke was accompanied by his wife, to whom we owe excellent photographs of landscape and folk. The volume presents the day's marches and the impressions made upon the travelers by the new country. It is planned to present the formal record of results in a succeeding volume. Such an exploration conducted by a

small party naturally has to utilize the hospitality and the transport of the natives; accordingly, the record is filled with shrewd estimates of the diversity of the mountain tribesmen. Such day by day record frequently offers us the most valuable data upon manners and customs. Particular interest attaches to the unexpected discovery of a tribe of pygmies never before reported from Kamerun. The existence of contemporary nanoid peoples has so illuminating a bearing upon the study of prehistoric man that the discovery of a new group of pygmies must be welcomed as one of the prizes of exploration.

WILLIAM CHURCHILL.

Und Afrika Sprach. Bericht über den Verlauf der dritten Reise-Periode der Deutschen Inner-Afrikanischen Forschungs-Expedition in den Jahren 1910 bis 1912. Von Leo Frobenius. 669 pp. Ills. Deutsches Verlagshaus, Berlin-Charlottenburg, 1913 (?). Mk. 20. 10 x 7½.

Under this somewhat cryptic title, we have the third series of reports of the travels of Frobenius in inner Africa, the Sudan and lands adjacent. He chooses to appeal to the popular interest. That his works have attained a large popular circulation and approval is fair enough testimony to a general interest in mysterious Africa. Here, as before, he elaborates his theory of Atlantis. It is the source for him of all that which otherwise in Africa would remain inexplicable. We need not comment upon the insubstantiality of Atlantis. It rests upon the statements of Plato and his copyists. What was the source whence Plato derived it we have no means of discovery. All our folk-lore is filled with these shadows out of the western sea—St. Brandan's Isle, Hy-Brasil, a dozen shadowy lands of the ocean. The theme is well worked out in Nansen's "In Northern Mists" and the myth is plain. Therefore it is out of the question to give serious consideration to an Atlantean source of the culture of African savages in any one group, wholly impossible to derive therefrom so many and such various cultures as are now established through more solid methods of investigation. Yet, apart from this hypothesis, the work is of great interest and contains a large mass of valuable information not elsewhere accessible.

WILLIAM CHURCHILL.

EUROPE

La Finlande aux Mille Lacs. Par Jules Leclercq. 282 pp. Map, ills. Plon-Nourrit et Cie., Paris, 1914. 7½ x 5.

Much interesting information is concentrated in this book. It is asserted that Finland is still in process of uplift. The number of islands is slowly diminishing, and whole portions of the old archipelago are now attached to the mainland. Mr. Leclercq tells us that more than one old fisherman remembers sailing his boat over the spot where now the shepherd pastures his sheep, but like similar evidence, such tales by unskilled observers have but a meager value until thoroughly checked by independent evidence. Many charming lakes and valleys were formerly arms of the sea.

In view of its location in the area of intense glacial erosion in the ice age it is natural that only one-twelfth of the land should be arable, about four-fifths forest, rock, and marsh, and one-eighth lake. In consequence the 2,500,000 inhabitants are occupying only a small fraction of the land and thus the density of population is very high. Politically Finland has been unhappy, for her relations with Russia are not congenial. The author explains much when he says that the ethnographic distance between Finland and Russia is perhaps greater than the geographic distance.

Schweden. Historisch-Statistisches Handbuch im Auftrage der Kgl. Regierung herausgegeben von J. Guinchard. 2. Auflage, Deutsche Ausgabe. Vol. 1: Land und Volk. xxiii and 850 pp. Vol. 2: Gewerbe. xi and 808 pp. Maps, ills., index. P. A. Norstedt & Söner, Stockholm, 1913. 9½ x 6½.

This admirable handbook will rank as a standard work on Sweden. It is remarkably comprehensive, covering every phase of the nature and development

of the country in chapters contributed by many authoritative writers. In the two volumes there are 17 chapters, including those on natural resources, agriculture, forestry, fauna, commerce, education, etc. The subdivisions under the chapter headings (*e. g.* Geography: Physical Geography by Gunnar Andersson; Water Systems, by A. Wallén; Climate, by N. Ekholm; Geology, by E. Erdman; Plant Geography, by H. Hesselman; Zoogeography, by N. von Hofsten; and others), are clearly treated and form concise and authoritative monographs. Approximately 240 writers were engaged in the compilation of this work. The index is a guide to all the various social, political, educational or scientific aspects of the country.

Editor and publisher demonstrate in this work the value of intelligent cartographic illustration. A wide range of facts is thus placed before the reader's eye in compact form. They enable him to obtain definite conceptions of many phases of Swedish life. The choice of the same scale (1:8,500,000) for each of the maps is fortunate, because it permits ready comparison. No amount of reading can impress one with demographic relations in Sweden as impressively as the set of maps devoted to this subject, and strongly reminiscent of pages of the *Atlas de Finlande*, published by the Geographical Society at Helsingfors. Resources and industries, the latter in all the variety which modern technology affords, are similarly represented in the second volume. Examination of these maps not only reveals restriction of the greatest intensity of life to southern Sweden, but explains the reasons for this fact.

Two Quaint Republics, Andorra and San Marino. By Virginia W. Johnson. 228 pp. Ills. Dana Estes & Co., Boston, 1913. 8 x 5½.

Andorra stands in a nook of the southern slopes of the Pyrenees, shut in on all sides by lofty peaks except to the south where the river Enbalire flows toward the frontier of Spain. Its area is 150 square miles. It has been independent since the latter part of the eighth century. East of Florence is the miniature republic of San Marino, with a population of nearly 8,000. The author tells of these little states, taking up their history, traditions, life and customs, and describing their economic resources.

WILBUR GREELEY BURROUGHS.

Höhlen im Dachstein und ihre Bedeutung für die Geologie, Karsthydrographie und die Theorien über die Entstehung des Höhleneises. Dem Andenken weiland Prof. Friedrich Simonys gewidmet von den Verfassern: H. Bock, G. Lahner und G. Gaunersdorfer. vii and 151 pp. Ills., index. Verein für Hölenkunde, Graz, Austria, 1913. Mk. 7. 12 x 9.

A handsomely printed, finely illustrated description of the many caves in this mountain mass southwest of Salzburg in the Tyrol. Mostly they are ice-caverns, and there are many pictures of great ice masses, ice stalactites and ice stalagmites, and accounts of the hazards of their exploration. A closing chapter gives a physico-mathematical theory of the air currents in the caves and of the freezing of the water. This is referred to cooling by evaporation of the cavern moisture in the constant winter indraft of air into caves that slope down into the ground. In summer the air blows strong out and is cold. The same temperature relations are observed in many caves where the temperature remains above freezing all summer. The main interest of the book, however, is the exploration of the caves and their curiosities. The number and variety of them that occur in the Dachstein is very great.

MARK JEFFERSON.

The Climate of Portugal and Notes on its Health Resorts. By Dr. D. G. Dalgado. 479 pp. Maps. Academy of Sciences, Lisbon, 1914. 9 x 6.

Portugal has not received the attention to which it is entitled by reason of its climatic advantages. It has the mildness of climate and the "Italian skies" which long ago made other parts of the subtropical belt famous as health resorts, but it has been largely neglected by health seekers. Dr. Dalgado, realizing this fact, has prepared an excellent account, in English, of the climates of his native

land, full of meteorological, medical and even botanical information, which may be recommended to those who wish to inform themselves concerning the climate of Portugal. The health resorts are grouped as (1) climatic, (2) mineral water, and (3) sea-bathing, and only those are described which are, or can be made, useful to foreigners.

R. DEC. WARD.

Russia and the World. A study of the war and a statement of the world-problems that now confront Russia and Great Britain. By Stephen Graham. xi and 305 pp. Ills. The Macmillan Co., New York, 1915. \$2. 8 x 5½.

Russia in war time, as seen by an English writer, who had tramped from the shores of the Black Sea to the borders of Mongolia. The writer is the sympathetic friend of Russia and things Russian. He describes the war as immensely popular among the Russian people; their war spirit, as religious enthusiasm, which immolates itself, seeking death without fear, and waging war as the remorseless, avenging angels of their God. The Russian people are depicted as kindly and tender to their captured enemies. The effect of the war is said to have been the unification of the various peoples and nationalities living under Russian rule. The future of the Poles and Jews, as well as that of the different combatants in the struggle, after the war is over, is forecast, but such predictions are at best only tentative and very far removed from what will actually result. Interesting pen portraits of the Czar and his Prime Minister, the latter based upon a personal interview, are worthy of note.

Die Schwarzerde (Tschernosiom). Von P. Kossowitsch. viii and 156 pp. Ills. Verlag für Fachliteratur, Berlin, 1912. 10 x 7.

An account of the nature, distribution, climate and origin of the Black Earth belt of south-central Russia, though we are told that chernozem also forms a strip across central Nebraska, Kansas, Oklahoma and Texas, and is found in much of the Argentine Pampa, and in southern India. It appears to be a residual soil, occurring on a great variety of bed rock, into which it grades downward, granites, sandstones, and limestones. Usually, unbleached carbonates abound below. The climate is always semi-arid and the humus a meter or more deep. Kossowitsch believes it came of the accumulation of the remains of abundant grasses growing in a continental climate with short spring rains, and dried and preserved through long, hot, dry summers, in which the vegetable matter did not decay. A characteristic is the vertical splitting familiar to all observers of *barranca* countries.

MARK JEFFERSON.

Greece of the Hellenes. By L. M. J. Garnett. 246 pp. Ills, index. Charles Scribner's Sons, New York, 1914. \$1.50. 7½ x 5½.

The possible influence of an environment is found in the attractive statement: "So great is the demand for books of a serious character that Greek publishers find it more profitable to produce historical and scientific works than even popular fiction." This volume is replete with live statements that hold one's interest. Essentially every phase of life in Greece is presented down to date. Government, education, religion, natural resources, commerce, urban and rural life, customs and character are all described.

It is stated that of the 33 varieties of olives 30 are cultivated in Greece. The annual export of olive oil amounts to over \$2,500,000. For a well-balanced treatise on Greece and the Greeks, this book recommends itself very highly. The frequent illustrations are all good.

EUGENE VAN CLEEF.

The Balkans: A Laboratory of History. By William M. Sloane. viii and 322 pp. Maps, index. Eaton & Mains, New York, 1914. \$1.50. 8½ x 5½.

After a consideration of Turkey and European politics, Mr. Sloane gives an account of the Balkan nations, their history, political, social, and religious problems, and the causes, progress, and results of their recent wars. "Physical geography," he says, "determines to a high degree the social structure of the inhabitants. Nowhere is the relation between man and his habitat

closer; nowhere are politics more sternly conditioned by natural resources and climate." Three maps show the boundaries before the war, boundaries agreed upon by Bulgaria and Serbia in secret treaty, and boundaries finally adopted. An excellent book.

WILBUR GREELEY BURROUGHS.

The Balkan Wars, 1912-1913. By Jacob G. Schurman. 140 pp. Map, index. Princeton Univ. Press, Princeton, 1914. \$1. 8 x 5½.

The author gives the history of the Turkish Empire in Europe, and of the earlier Slav empires. He tells how Serbia, Greece, Bulgaria, etc., obtained their independence. He takes up the causes of the war between Turkey and the Balkan States in 1912, the Cretan question, and shows the diplomatic moves made by the nations involved. The military operations are described, and the terms of peace considered. The war between the Allies, filling the last half of the book, discusses the causes of the war, military operations, the part Rumania played, the problem of Albania, and the final distribution of territory. Maps show the Balkan Peninsula before and after the wars.

WILBUR GREELEY BURROUGHS.

Servia of the Servians. By Chedo Mijatovich. New edit. ix and 234 pp. Ills., index. Charles Scribner's Sons, New York, 1913. \$1.50. 7½ x 5½.

The author, formerly Servian Minister at the Court of St. James, says that what he wishes to do in this book is to supply his readers "with the material which eventually will enable them to have a glimpse into the soul of the Servian people, and form their own judgment on its character and ability." He treats of Servian history, politics, religion, and customs, introduces typical Servian anecdotes, national songs, popular music, and proverbs, writes of Servian literature, tells of the economic resources, and gives specimens of Servian folk-lore and statistical data. The book is well illustrated, interesting and thorough.

WILBUR GREELEY BURROUGHS.

La Turquie que l'on voit. Par L. de Launay. 2e édit. Collection des Voyages Illustrés. 270 pp. Maps, ill. Hachette & Cie., Paris, 1914. Fr. 4. 7½ x 5.

The book is a model of cleverly recorded, intelligent observation. It is the product of two trips undertaken at twenty years' interval. Its text is as ripe in thought as the subjects described are mellow with age. It is devoid of distinctive features yet every page appeals forcibly to the reader.

LEON DOMINIAN.

Island: Das Land und das Volk. Von Paul Herrmann. (Aus Natur und Geisteswelt.) 113 pp. Ills. B. G. Teubner, Leipzig, 1914.

The modest volume embraces an encyclopædic yet very readable account of the land and people of Iceland. The author has drawn upon his travels as well as upon much statistical material. Geographical factors are stressed.

The brief caption "Land" includes a good geomorphological summary. More attention is given to the people, their history, character, economic conditions, and material and spiritual culture. The struggle against a severe environment, the sufferings inflicted by catastrophes of ice and fire have moulded a complex and contradictory national character. On the one hand, the Icelander is courageous, self-reliant to stubbornness, democratic, and tenacious of word and friendship. On the other side, the author discovers an all-pervading pessimism, a tendency to theorize rather than to do, and a lack of energy and of perseverance, which he refers to the unfriendly nature that has so often set at naught the works of man. The unparalleled catastrophes of the eighteenth century turned the minds of the people from their bitter present to the glorious past. The whole nation withdrew to the quiet of intellectual life, and found release in a wonderful literary activity.

Agriculture is described as being in need of regeneration. Sheep-raising and gardening alone have made appreciable progress. In some ways farm conditions are less good than they were a thousand years ago. More labor,

fertilizing, drainage, and reforestation are needed. With proper conservation of its resources, Iceland should support many times its present population.

CARL O. SAUER.

The Botany of Iceland. Edited by L. Kolderup-Rosenvinge and Eug. Warming. Part 1: 1. The Marine Algal Vegetation. By Helgi Jónsson. 186 pp. Ills. 2. An Account of the Physical Geography of Iceland with special reference to the Plant Life. By Th. Thoroddsen. (Published by the aid of the Carlsberg Fund.) pp. 192-343. J. Frimodt, Copenhagen, 1914. 10½ x 7.

Section 1 of this important work deals with the marine vegetation and is written by Dr. Helgi Jónsson. The author gives a list of 200 species of marine algae found along the coasts of Iceland. The life conditions of the marine vegetation (light, salinity, etc.), the horizontal distribution and the components of the algae flora are considered in detail. An important chapter treats of the vertical distribution of the Icelandic algae. Illustrated with a number of good photographs, the sixth chapter gives an account of the marine algal vegetation and the sea-grass vegetation, which the author arranges under the captions 1. The Littoral Zone: (a) the photophilous communities, (b) the shade vegetation, (c) the vegetation of the tidal pools; 2. The Semi-Littoral Zone with its several associations; 3. The Sublittoral Zone with its associations. The sea-grass vegetation comprises the *Zostera* association found especially on the muddy-clay bottoms. The author gives a useful summary of the periodic changes of the marine algae throughout the year with a table of the fruiting periods of the species.

Section 2, Part I, published two years later in 1914, gives a comprehensive description of the physical geography of Iceland, its lowlands, snow mountains, plateaus, rivers, hot springs, geysers and snow fields. The geology is given in detail in connection with the volcanic activity displayed by Hekla and other volcanoes, with the deposit of lavas and beds of ashes. The main features of the climate are made prominent. Chapter IV treats of the general distribution of plant life and Chapter V is an interesting sketch of the chief plant formations of Iceland, such as that of the coast line, of the fresh water, wet soil, river gravels, rocky flats, sandy tracts, lava streams, the grassland, the home-field, the heather moors and birch coppices where *Betula Odorata* may grow to a height of 8-9 meters.

JOHN W. HARSHEBERGER.

Iceland: Horseback Tours in Saga Land. By W. S. C. Russell. xii and 314 pp. Ills., index. R. G. Badger, Toronto, 1914. \$2. 8 x 5½.

The author's experience as geologist during the summer of 1911, in the Stackhouse expedition, and in his other visits to Iceland in 1909, 1910 and 1913, make a book of considerable interest to the earth scientist. On the other hand, the volume is well designed for popular reading. To the geologist the more or less fragmentary references to earth features are suggestive. A Tertiary tree, five inches in diameter, with replacements by zeolites and chalcodony, and the discovery of Pliocene shells indicate the possibilities of future work along this line on the east coast. Some lignitic beds were found, but the author declares against any probable extent of coal beds, because "the fierce volcanic fires would have destroyed this substance had it ever existed." He seems to have forgotten that anthracite beds of considerable importance have been developed by the baking due to intruded lavas. The great volcanic mass of Hekla, the geyser region and the numerous areas of extinct volcanoes are interestingly described. The industry and intelligence of the people and their honesty are emphasized. The photographs are numerous and excellent.

F. V. EMERSON.

WORLD AND PARTS OF IT

Social Forces in England and America. By H. G. Wells. 415 pp. Harper & Brothers, New York, 1914. \$2. 9 x 6.

A collection of uncorrelated essays, ranging from Blériot's crossing of the English Channel by aeroplane, to the contemporary novel, the endowment of

motherhood, and the conquest by man, in his evolution, of the natural forces by which he is surrounded. Mr. Wells allows his fancy, which has hitherto more often played on the scientific fiction of the Jules Verne order, to rove over the fields of Socialist endeavor. The most striking thing in his book is his prevision of the then future, but now present war between England and Germany. Strange to say, his forecast of naval strategy, tactics and fighting has been verified in every detail up to the present writing, while his prediction of the outcome of operations on land is entirely contrary to the facts as they have happened. Mr. Wells calls himself an adherent of Socialism, but not of the red flag anarchistic Socialism common in this country. He follows that more comfortable British Socialism, which looks forward to a society, in which every man will do a small amount of work and will have much time for leisure and self-improvement.

DAVID H. BUEL.

Latin America: Its Rise and Progress. By F. Garcia Calderon. Translated by Bernard Miall. 400 pp. Map, ill., index. Charles Scribner's Sons, New York, 1913. \$3. 9 x 6.

The history, politics, economic and social science, literature, philosophy and other phases of the Latin American countries are considered. The author also discusses what he styles the German, North American and Japanese perils. Concerning these perils—Germans are dispersed throughout Chile, Venezuela, Peru and Central America, and are concentrated in Brazil in the provinces of Santa Catalina, Parana, and Rio Grande do Sul. There are 350,000 Germans ruling the municipalities, enjoying the rights of self-government, and living in aristocratic isolation. They retain the German language, traditions, and prejudices. Calderon, however, does not consider the German peril as serious. He points out that the 350,000 Germans are lost in the mass of 19,000,000 Brazilians; that theoretically it would take 18,000,000 to 20,000,000 German emigrants to make these states German, and that in the last ten years barely 30,000 Germans have left their Fatherland and these are divided among the United States, Central America, and Brazil. The Italians are invading Argentine and Southern Brazil, more than 50,000 emigrating from Italy annually. The Italians' affinities are the same as those of the natives, they adapt themselves to the new country, and transmit their Latin heritage to their children.

As for the North American peril, "the tutelage of the United States seems to Latin Americans to be more dangerous than the German invasion. To save themselves from Yankee imperialism the American democracies would almost accept a German alliance, or the aid of Japanese arms; everywhere the Americans of the North are feared."

In the chapter on the Japanese peril, the author believes that "before ruling America the Japanese, exposed to the hostility of the Californians, will fight in the North the great battle that will decide their fate."

The conclusion of the book is given to the problems which Latin America faces: problems of unity, race, population, financial conditions, and politics. There are numerous photographs of Latin American leaders; also a large map showing the sources of the principal products and industries of the various countries. This work, written by a Peruvian diplomatist, is well worth thoughtful consideration.

WILBUR GREELEY BURROUGHS.

West Indies and Guiana. With Honduras, Bermuda and the Falklands. 6 lectures prepared for the Visual Instruction Committee of the Colonial Office. By A. E. Aspinall. (Visual Instruction Committee Handbooks No. 6.) 152 pp. Map, ill. G. Philip & Son, London, 1914. 8d. 7½ x 5½.

The physiography, geology, industries and life of these countries are considered, together with their history from the days of the earliest explorers. Descriptions of present day scenes and places add vividness to the text. The chapter on British Honduras says that "the greater part of the interior of British Honduras is still unexplored, and the western boundary is an artificial one, of which part only has been surveyed." Also of interest is the descrip-

tion of the cohune palm, which grows in great abundance, yielding large quantities of a nut rich in fat as valuable as that of the cocoanut. The cohune palm nut has never been exploited, for it is very hard and no machine has been adapted to crack the nuts without injuring the kernels. Suitable machines, however, have now been invented and the author believes that "a new industry of great value to the colony may be established." Photographs and maps illustrate this well-written book. WILBUR GREELEY BURROUGHS.

Conquest of the Tropics. The story of the creative enterprises conducted by the United Fruit Company. By Frederick U. Adams. xii and 368 pp. Ills., index. Doubleday, Page & Co., Garden City, 1914. \$2. 9 x 6½.

The United Fruit Company is the main subject. The company in 1913 owned or leased 1,210,443 acres of land, of which 313,347 were improved. The difficulties the company has overcome, its stupendous operations and transportation facilities by which fruits are brought to consumers in the United States and elsewhere, an especially detailed account of the banana, the principal fruit handled by the company, and the lands in which the banana grows are among the subjects considered.

An acre of developed banana plants will yield annually from 150 to 300 bunches, with 200 bunches as a high average. The independent grower makes from \$60 to \$70 gross from an acre. The author presents the following suggestive table:

Food article	Percentage of retail price received by the farmer	Percentage of retail price received by transportation and middle men
Onions.....	10	90
Potatoes.....	14	86
Cabbages.....	20	80
Bananas.....	50	50

In 1913 the Fruit Dispatch Company alone handled for the United Fruit Company over 50,000 cars of bananas. The publishers say the book is the first of "a series planned to describe certain big businesses whose histories and operations concern and should interest the public."

WILBUR GREELEY BURROUGHS.

And That Reminds Me. Being incidents of a life spent at sea, and in the Andaman Islands, Burma, Australia and India. By Stanley W. Coxon. xvi and 324 pp. Ills. John Lane Co., New York, 1915. \$3.50. 9 x 6.

Stanley Coxon's life has been full of adventure. He began his career in 1875 as midshipman in the merchant service and was on sailing ships for eight years, making eight voyages round the world. Then he served on steamboats along the coast of India, worked as a camel driver during the Egyptian war, and, on returning to Rangoon, was appointed temporary first-grade officer on the Royal Indian Marine ship *Kwangtung*, which guarded the Andaman and Nicobar Islands. His next position was that of assistant district superintendent of police in Burma, where he fought dacoits. Finally, he became Assistant Commissioner at Raipur, India, and saw famine there and the relief work carried on. Throughout the book he tells not only of his own personal experiences, but also depicts the life of the countries in which he lived. He writes in a sprightly style, and his book is well illustrated with photographs.

WILBUR GREELEY BURROUGHS.

The World and Its Discovery. A description of the continents outside Europe based on the stories of their explorers. By H. B. Wetherill. (The Oxford Geographies.) 320 pp. Maps, index. Oxford University Press (American Branch), New York, 1914. 7½ x 5½.

In the author's words, "the object of this book is to arouse an interest in stories of discovery and then utilize it in behalf of Geography." The book is apparently intended as a sort of supplementary reader for use in English schools.

Although dated 1914, strangely enough discussion of modern exploration and discovery is touched upon only in the concluding sentence of the book. "Stein and Sven Hedin did similar work in Asia, and Parry, Franklin, Nansen, Amundsen and Peary explored in the Arctic, and Ross, Bruce, Shackleton, Scott, Charcot, and Amundsen in Antarctica, all of them working to improve man's knowledge of Geography." The difficulty of writing upon so vast a topic in so limited a space becomes apparent in the abruptness with which some topics are introduced or left. However, the fresh style plus the seemingly well-selected points retain the interest of the reader.

A goodly distribution of the customary English black-and-white maps helps to illuminate the text.

EUGENE VAN CLEEVE.

ANTHROPOGEOGRAPHY

Heredity and Environment in the Development of Men. By Edwin Grant Conklin. (Norman W. Harris Lectures for 1914 at Northwestern University.) xiv and 533 pp. Ills., index. Princeton University Press, Princeton, 1915. \$2. 8½ x 6.

The attempt is to present the results of the later studies of heredity to general audiences. The origin of the individual and the possibility of directing his development is regarded as the most important topic for men to consider; for no scheme of social progress can be so basal and no results so permanent as those which are established in the blood of the race.

In chapters on the "Facts and Factors of Development" and "The Cellular Basis," the author translates for the ordinary reader the terminology and leading principles of present-day biology. The phenomena of inheritance are then treated and it is recognized that among men, experimentation is difficult and it is often impossible to separate the results of heredity from those of environment. Contrasted with chemical compounds, which are constant, every organic individual is unique, such individuality being ascribed to mixture of ancestral character, the appearance of mutations (*de Vries*) and fluctuations due to environment.

The chapter on "Influences of Environment" invites the geographer's attention. The great problem of development is to assign just values to "nature" and "nurture," that is, to heredity and environment. Environment includes education and raises the old question of adding to stature by taking thought. Past emphasis has been on the effectiveness of environment. Modern studies, however, place overwhelming stress on heredity; species-making by controlling the environment is discounted, and belief in the omnipotence of environment has declined. Men are held to be by no means chiefly the product of environment and training. While accepting this modern placing of the emphasis, the author warns us not to go too far, or to neglect the efficiency of environment. These are sobering words, and place upon students of geography the duty of finding their own sphere, and of determining its limits. It is no sin for the geographer to cross this boundary, but he should at least know when he does it. Non-geographic readers will doubtless pay most heed to the discussion of eugenics and of genetic and ethical problems, with which the volume closes. A. P. BRIGHAM.

Natur und Mensch. Von M. G. Schmidt. Series: *Aus Natur und Geisteswelt*. 105 pp. Ills. B. G. Teubner, Leipzig, 1914. Mk. 1.25. 7½ x 5.

In a small volume, a most interesting and instructive review is given of the principles of anthropogeography. Every sentence is filled with solid thought and definiteness of idea. The author recognizes the independence of man relative to his environment; on the other hand he is a faithful believer in the influence of the physical earth upon all people; be this influence ever so indirect, it is a factor which cannot be brushed aside unnoticed.

The text is divided into three principal parts:— (1) Physical Dependence, (2) Community of Interests; (3) Psychical Dependence. The last part is perhaps worthy of more attention than the other parts. It is discussed under two headings: Character and Intellectual Life, the latter subdivided as fol-

lows: (a) Education; (b) Religion; (c) Poetry; (d) Art. The influence upon character of climate, mountains, coasts, islands, seas and of mere size of area (roominess) are all pointed out as potent factors. It is of interest to note that the author considers size of area to have been one of the most important influences upon the character of the North American. The facility of movement, the desire to accomplish unusual things, the apparent boundlessness of his plans both in business and politics, the joy in "making possible the impossible" and the mania for undertaking monumental works in technical fields, are all attributed to the mere bigness of the American's environment.

The discussion of the various religions of peoples as influenced by the surface conditions and the atmosphere is well worth reading closely. The effect of the elements upon the poetry of peoples is also striking. Even in Art the author finds that not only has nature exercised a controlling influence in the style in ages past but also in the spread of styles to various parts of the earth. Even to-day, when man supposedly is independent of his environment, his art and architecture seem to feel the effects of nature's presence.

EUGENE VAN CLEEF.

ECONOMIC AND COMMERCIAL GEOGRAPHY

Wireless Telegraphy. By C. L. Fortescue. (Cambridge Manuals.) viii and 143 pp. Ills., index. G. P. Putnam's Sons, New York, 1913. 40 cents. $6\frac{1}{2} \times 5$.

The book is written by a physicist who has his subject well in hand.

The first half deals with the mechanics of wireless telegraphy, and discusses a few of the fundamental principles of physics upon which the construction of the instruments is based. The last half presents a very interesting account of the actual rôle of wireless telegraphy to-day. One chapter deals with wireless telephony. This is followed by a brief history of wireless telegraphy beginning with Maxwell's publication of a paper entitled "A Dynamical Theory of the Electromagnetic Field" read before the Royal Society (England) on Dec. 8, 1864. A short bibliography, including 5 French, 3 German and 10 English titles, completes the thesis.

The author in his preface says "A general scientific knowledge is necessary to understand the subject. This knowledge, however, may be very elementary."

EUGENE VAN CLEEF.

Die Jute. Ihre Industrie und volkswirtschaftliche Bedeutung. Von Richard Wolff. 147 pp. Diagrams. F. Siemenroth, Berlin, 1913. Mk. 6. $9\frac{1}{2} \times 6\frac{1}{2}$.

In short space much valuable material is brought together relative to the jute industry. The principal topics are:—uses of jute; experimental cultivation of it in various regions, as in Egypt, China, Kamerun, and the United States; substitutes both natural and artificial; and the industry in general, followed by a specific study of it in India, Scotland, Germany, Austria-Hungary, France, Italy, Russia, Belgium, Sweden, Brazil, Japan and the United States. A full bibliography, a series of large graphs folded in the back of the book, and statistical tables complete the book. While technically the jute industry is eighty years old, the fiber has been utilized locally in India for centuries. India practically controls the world's supply. Experiments carried on in other countries in the hope of making them independent of India, though not always complete failures, have in general failed to accomplish their purpose.

EUGENE VAN CLEEF.

Lumber and Its Uses. By R. S. Kellogg. 352 pp. Ills., index. Radford Architectural Co., Chicago, Ill., 1914. \$1. $9 \times 6\frac{1}{2}$.

After two chapters of a general nature on the structure of wood and its physical properties, the author treats his subject in a detailed and strictly technical manner. There are chapters upon lumber grades and sizes, seasoning timber and wood preservation, and paving and flooring, all considered minutely.

Mr. Kellogg is apparently master of his subject, and is writing for those who have especially to do with timber and lumber. The book has no preface or table of contents and the chapters are not numbered; but there is a careful index. Dealers in wood products, lumber men and engineers will find it useful as a hand book.

R. MALCOLM KEIR.

EDUCATIONAL

Bilder-Atlas zur Länderkunde. Eine Ergänzung für Schulatlanten und erdkundliche Lernbücher insbesondere für Alfred Kirchhoffs Erdkunde für Schulen und Daniels Leitfaden der Geographie. Von Felix Lampe. 31 pp. of text, 246 ills. Buchhandlung des Waisenhauses, Halle a. d. S. 1914. Mk. 2. 10 x 7.

An interesting collection of pictures. The book needs the texts to which the pictures are supplementary in order to be of largest service. Any attempt to give an adequate idea of the countries of the world in 246 views must leave much to the imagination. At the same time with careful selection of typical scenes, as most of these are, it is remarkable how much may be done. The pictures, on the whole, are very clear, but a few have suffered in reproduction.

ROBERT M. BROWN.

College Physiography. By R. S. Tarr. Published under the editorial direction of L. Martin. xxii and 837 pp. Maps, ills., index. The Macmillan Co., New York, 1914. \$3.50. 9 x 6.

The late Professor Tarr wrote the first draft of twenty chapters. Prof. Martin, the junior author, wrote the remaining seven chapters (atmosphere and terrestrial magnetism) and took entire editorial charge. The volume is of college grade in fullness of presentation, and in the fact that rival theories are presented and discussed. Considerable emphasis is placed on human relationships. Inquiry into some problems is excluded as outside the subject, *e. g.*, the manner of ice flowage, which is referred to the physicists. The chapters on glaciation have been much enriched by the senior author's original studies in Alaska, Greenland, Europe and New York State. The normal geographical cycle and its terms are clearly set forth; it is to be regretted that the arid cycle was not similarly presented.

The abundant illustrations are, for the most part, fresh and illuminative and include, in addition to many original ones, diagrams and photographs from the best and most recent publications. The ten topographic maps, each presenting a notable relief form, are highly instructive. No specific list of good maps is given, nor are there specific directions as to how readers may obtain the particular maps referred to at the ends of chapters. The bibliographies are rich and complete. The index has been well done with reference both to topics and authors.

C. D. VON ENGELN.

Elements of General Science. By Otis W. Caldwell and William L. Eikenberry. xiv and 308 pp. Maps, ills., index. Ginn & Co., Boston, 1914. \$1. 8 x 5½.

High school teachers who have struggled with the problem of selecting a course in general science and securing encouraging results from their work should be grateful for this book. The authors are skilful teachers who have applied to their work the knowledge of the scientist, controlled by a sane and sympathetic comprehension of the minds and attitudes of boys and girls of high school years. A valuable feature of the book is the simple and effective way in which all the body of knowledge discussed is shown to bear directly on the student's life and needs. Possibly this has never been so well done before as in the section "Water and its Uses." The style is both forceful and interesting, the illustrations and type are excellent. The cause of science teaching in the schools has received a valuable impetus in the right direction.

CAROLINE W. HOTCHKISS.

A Text-Book of Geography. Practical and Physical. By Ronald M. Munro. 480 pp. Maps, ills., index. J. Cormack, Edinburgh, 1914 (†). 7½ x 5½.

"The aim of this book," the author says, "is to provide in a single volume a reasoned account of the chief facts of astronomical, mathematical, physical, practical, biological, commercial, and historical geography, in order that the pupil may be able to adopt the scientific method in his study of regional geography, and discover to what extent the events of history have been controlled by geographical conditions." The influence of the inorganic upon the organic is emphasized. The book is well illustrated and concisely written.

WILBUR GREELEY BURROUGHS.

A Commercial Geography of the British Isles. By Frederick Mort. 152 pp. Maps, index. Oliver & Boyd, Edinburgh, 1914 (†). 1s. 7½ x 5.

The author shows the influence of physiographic elements upon the various industries. He first takes up the general geographical factors that influence commerce; next, the commodities that enter largely into the commerce of the world, considering for each product its origin, preparation, etc., its sources of supply, and places of ultimate consumption. A study of the commercial geography of the British Empire completes the work. Tables are given showing the articles of commerce and the value of each article which England receives from and sends to each of the countries with whom she trades.

WILBUR GREELEY BURROUGHS.

The United States by Groups and by States. By William Rabenort. viii and 232 pp. Maps, ills., index. American Book Co., New York, 1914. 50 cents. 9 x 6.

It is somewhat discouraging that there are still publishers who will print poor material despite the high standard they set for themselves. In a word this book is bad. Its title indicates its scope. The series of facts are often related incoherently. The English in general is certainly a poor model for students in "Grade 5B." The map work is unsatisfactory. Will American publishers ever learn to make good maps in all texts?

The chief manufactured product of Superior, Wis., is not flour; the discussion of climate in most instances is incomplete. "Like Ocean Grove, Asbury Park, Cape May and other resorts it [Atlantic City] has a long board walk along the ocean." Of what geographical significance can such a statement be?

EUGENE VAN CLEEF.

Der erdkundliche Unterricht an höheren Lehranstalten. Von Richard Lehmann. (Series: Vorlesungen über Hilfsmittel und Methode des Geographischen Unterrichts. Von R. Lehmann. 2. Band.) 387 pp. ills. Tausch & Grosse, Halle a. d. S., 1913. Mk. 7.50. 9½ x 6½.

The "higher schools" referred to are *Gymnasien* and *Realschulen*, in which the pupils range from 8 to 18 years on the average. They have a sufficient number of points in common with our graded and high schools to make a comparative analysis of pedagogic methods profitable.

The central topics of this book on geography methods are: the place of geography in the school course, the teacher of geography, the distribution of subject matter by grades, home geography and basal concepts, the study of earth features, and regional geography. The general method may be summarized as consisting (1) of a progression from the simple to the complex rather than from the near to the far; (2) utilization of the didactic value of contrasts; and (3) abundant repetition, but in varied form. The work begins with a study of the child's environment, in which material belonging to general science and to local history is included. The author believes in excursions at this and other stages of the work. From home geography he turns to the contrasts given by distant parts of the world. The simplest continent is studied first, and the study of Germany is reserved to the last, as being most complex. The work in the middle classes is distinguished by the emphasis placed

upon climate and the making of maps. Physical processes and economic conditions are not stressed much until in the highest classes, where they form the basis of most of the study.

Especially stimulating is a discourse on the intellectual and material value of geographical study, to which is added an essay on its ethical moment. The volume also contains a strong chapter on the use of graphs, and one on the qualities desired of a school text. The references to literature are voluminous and critically annotated.

The reader is overwhelmed by the fullness of the syllabus. Each topic is treated with a thoroughness that is admirable but a little pedantic. The author has left in some parts very little to the imagination of the reader. At the same time the selection of material is based on sound common sense. Its grading is carried through consistently, and the model lessons are presented clearly and appropriately. The author has a most serious and sensible conception of the intensely practical mission of geographical instruction.

CARL O. SAUER.

An Introduction to General Geography. By Alec A. Golding. x and 222 pp. Ills., index. University Press, Cambridge; G. P. Putnam's Sons, New York, 1915. \$1. 5½ x 8.

According to the author's preface, this is a volume of slightly expanded notes acquired through several years of classroom work. It has the merits and demerits of such records: a clear perception of and help to the solution of certain general difficulties and perplexities and, on the other hand, a limited and individual view point. Moreover the "note" character crops out in several incomplete and, hence, misleading statements: "A very large proportion of India has been cleared, but probably no country has been so thoroughly cleared as China. In both countries the cutting of timber is regulated by government." (p. 107); "The potato plant was probably a native of Chile but was extensively cultivated before America was discovered" (p. 114); the paragraph headed "Savanna" is mainly a description of desert vegetation, and so forth. Maps and diagrams show a laudable striving after clarity and simplicity. In some cases the maps are on too small a scale: thus the mean annual rainfall map of the world fails to show the Peruvian coast as a rain shadow while, through the confusion of lines, the population density map does not show whether the desert of Atacama has notably more or less than 100 people to the square mile.

OTHER BOOKS RECEIVED

These notes do not preclude more extended reference later

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ANNAPOLIS. History of ye ancient city and its public buildings. Compiled by Oswald Tilghman. 47 pp. Ills. Executive Dept., Annapolis, 1914. 6½ x 4.

FACTS ABOUT TENNESSEE. 49 pp. Ills. Dept. of Agriculture, Nashville, 1915. 6 x 3.

FARM FORESTRY. A text book dealing with the wooded parts of southern farms and the problems growing out of them, for use in agricultural high schools and colleges. By Alfred Akerman. 58 pp. Ills., index. The author, Athens, Georgia, 1914. 80 cents. 8½ x 5½.

THE GENTLE PIONEERS. By one of them, R. Habersham Barnwell. [Camping trip through Colorado.] 363 pp. R. G. Badger, Boston, 1915. \$1.25. 7½ x 5.

GESCHICHTE DER VEREINIGTEN STAATEN VON AMERIKA. Von E. Daenell. (Series: Aus Natur und Geisteswelt.) 2nd revised ed. 126 pp. B. G. Teubner, Berlin, 1914. Mk. 1.25. $7\frac{1}{2} \times 5$.

LOS ANGELES IN SÜDCALIFORNIEN: Eine Blume aus dem goldenen Lande. 2nd ed. 240 pp. Map, ills. Leo Woerl, Leipzig, 1885. Mk. 1.50. $6 \times 4\frac{1}{2}$.

SPANISH MISSION CHURCHES OF NEW MEXICO. By L. Bradford Prince. 373 pp. Ills. The Torch Press, Cedar Rapids, Ia., 1915. \$1.50. $8 \times 5\frac{1}{2}$.

CENTRAL AMERICA AND WEST INDIES

FLORA OF JAMAICA, containing descriptions of the flowering plants known from the Island. By William Fawcett and Alfred B. Rendle. Vol. 3: Dicotyledons. Families Piperaceæ to Connaraceæ. xxiv and 280 pp. Ills., index. British Museum, London, 1914. 9×6 .

WHO BUILT THE PANAMA CANAL? By W. Leon Pepperman. xiv and 419 pp. Ills., index. E. P. Dutton & Co., New York, 1915. \$2. $9\frac{1}{2} \times 6$.

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THE ARGENTINE IN THE TWENTIETH CENTURY. By Albert B. Martinez and Maurice Lewandowski. Translated by B. Miall. liii and 376 pp. Charles Scribner's Sons, 1909(?). $8 \times 5\frac{1}{2}$.

SOUTH AMERICAN HANDBOOK. A compilation of information and statistics regarding the public indebtedness, foreign commerce and railway development of the South American Republics. 55 pp. Index. Natl. Foreign Trade Council, New York, 1915. 25 cents. 9×6 .

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CHARAKTER UND POLITIK DES JAPANERS. Von Dr. W. Prenzel. 56 pp. (Series: Deutsche Kriegsschriften, No. 7.) A. Marcus & E. Webers Verlag, Bonn, 1915. 80 pfg. 9×6 .

AUSTRALASIA AND OCEANIA

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THE BALKAN COCKPIT: The Political and Military Story of the Balkan Wars in Macedonia. By W. H. Crawford Price. xii and 369 pp. Maps, ills. T. Werner Laurie, Ltd., London, [1914?]. 12s. 6d. $8\frac{1}{2} \times 5\frac{1}{2}$.

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THE ENGLISH COUNTRYSIDE. By Ernest C. Pulbrook. xvi and 120 pp. Ills., index. Charles Scribner's Sons, New York, 1915. \$3. $9\frac{1}{2} \times 7$.

CAMBRIDGE COUNTY GEOGRAPHIES: Clackmannan and Kinross. By J. P. Day. viii and 145 pp. Moray and Nairn. By Charles Matheson. x and 139 pp. Maps, ills. University Press, Cambridge, 1915. G. P. Putnam's Sons, New York. 1s. 6d. each. $7\frac{1}{2} \times 5$.

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VAL DI CECINA: Monografia Geografica. Di Clary Ceccarelli. 89 pp. Map. Novelli e Castellani, Faenza, 1913. L. 2. 9½ x 7.

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[Mr. Morice lived for many years among the Dénés (Tinneh). From his long study of their sociology, psychological characteristics, geographical nomenclature, habitations, etc., and his comparisons of them with the natives of north-east Asia, as revealed by scientific study, he believes he has proven, if not absolute community of origin, at least past intercourse between the northeastern Asiatics and northwestern Americans.]

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NEW MAPS

EDITED BY THE ASSISTANT EDITOR

For system of listing maps see p. 75 of this volume

MAPS ISSUED BY UNITED STATES GOVERNMENT BUREAUS

U. S. GEOLOGICAL SURVEY

Topographic Sheets

(Including Combined and Special Topographic Maps)

California. (a) Concord Quadrangle. Surveyed in 1893-94; culture revised in part in 1913-14. 1:62,500. 38°0' - 37°45' N.; 122°15' - 122°0' W. Contour interval 25 ft. Edition of June 1915.

(b) Haywards Quad. Surveyed in 1896; culture revised in part in 1913-1914. 1:62,500. 37°45' - 37°30' N.; 122°15' - 122°0' W. Interval 25 ft. Edit. of June 1915.

(c) Merritt Quad. Surveyed in 1905. 1:31,680. 38°37'30" - 38°30'0" N.; 121°52'30" - 121°45'0" W. Interval 5 ft. Edit. of June 1915.

(d) San Francisco Quad. Surveyed in 1892-94; culture revised in 1914. 1:62,500. 38°0' - 37°45' N.; 122°31' - 122°15' W. Interval 25 ft. Edit. of June 1915.

(e) San Mateo Quad. Surveyed in 1892; culture revised in part in 1914. 1:62,500. 37°45' - 37°30' N.; 122°31' - 122°15' W. Interval 25 ft. Edit. of June 1915.

(f) Swingle Quad. Surveyed in 1905. 1:31,680. 38°37'30" - 38°30'0" N.; 121°45'0" - 121°37'30" W. Interval 5 ft. Edit. of June 1915.

[Maps (a), (b), (d) and (e) are the four sheets mainly constituting the San Francisco area as represented on the special map listed under "California (c)" in the *Bull.* for August (1915, pp. 634-635). As regards physical features, they are reprints of the first editions of 1897-99; but as to culture,

which has materially changed since, they have been thoroughly revised. Maps (a) and (f) belong to the two-inches-to-the-mile series of the Great Valley of California.]

Illinois. Mount Olive Quad. Surveyed in 1913. 1:62,500. 39°15' - 39°0' N.; 89°45' - 89°30' W. Interval 20 ft. Edit. of June 1915.

Nevada. Yerington District. Surveyed in 1913-1914. 1:24,000. 39°2'0" - 38°54'30" N.; 119°17'0" - 119°9'30" W. Interval 25 feet. Edit. of June 1915.

[Special map representing in much greater detail an area included in the old Wabuska, Nev., and Wellington, Nev.-Cal., sheets in 1:25,000 published in 1893-94.]

Ohio. (a) Brinkhaven Quad. Surveyed in 1912-1913. 1:62,500. 40°30' - 40°15' N.; 82°15' - 82°0' W. Interval 20 ft. Edit. of June 1915.

(b) Coshocton Quad. Surveyed in 1912-1913. 1:62,500. 40°30' - 40°15' N.; 82°0' - 81°45' W. Interval 20 ft. Edit. of June 1915.

(c) Millersburg Quad. Surveyed in 1912-1913. 1:62,500. 40°45' - 40°30' N.; 82°0' - 81°45' W. Interval 20 ft. Edit. of June 1915.

(d) Waynesville Quad. Surveyed in 1913. 1:62,500. 39°45' - 39°30' N.; 84°15' - 84°0' W. Interval 20 ft. Edit. of July 1915.

[On the southern part of map (b) the contour multiples of 100 ft. are emphasized somewhat less than usual (less than on the adjoining sheet, map (a), for instance) thus failing to relieve the natural monotony of the dissected upland surface represented. On map (d) the southern edge of Dayton is included.]

South Dakota. (a) Spearfish Quad. Surveyed in 1898; partial revision in 1913. 1:62,500. 44°30' - 44°15' N.; 104°0' - 103°45' W. Interval 50 ft. Edit. of June 1915.

(b) Sturgis Quad. Surveyed in 1897; partial revision in 1913. 1:62,500. 44°30' - 44°15' N.; 103°45' - 103°30' W. Interval 50 ft. Edit. of June 1915.

[These sheets are revised from the original editions published in 1900 and 1899, respectively. The revision refers both to culture and relief; the largest changes in the latter are on the Spearfish sheet and near the towns of Lead and Deadwood. The reduction of the two sheets formed the northern half of the Deadwood sheet, 1:125,000, published in 1901. The present changes will necessitate a slight modification of the larger sheet.]

West Virginia. Pickens Quad. Surveyed in 1913. 1:62,500. 38°45' - 38°30' N.; 80°15' - 80°0' W. Interval 50 ft. Edit. of June 1915.

[Coextensive with the southeastern quarter of the old Buckhannon sheet, 1:125,000, last published in 1896. In the nomenclature of streams the present sheet tends to the principle of deciding which headwater branch of a stream constitutes its main source and then extending the name of the main stream up to the head of this branch. This is done in the present case with the Tygart and Middle Fork Rivers. The lower course of the latter, represented on the recent adjoining Sago sheet (see *Bull.*, Vol. 47, 1915, p. 156), is there termed Left Fork. The upper course of the former is termed Valley River on the Buckhannon sheet. The present map is similarly at variance with the nomenclature of the base map of West Virginia, 1:500,000, recently published by the Survey, which favors separate names for headwater branches, therein probably reflecting local usage. Added confusion in the drainage names of the region is caused by the fact that the usual designation of right and left branches is reversed, i.e. the branch entering from the right on looking *up-stream* is called "Right Fork," etc. This is the case with the Right and Left Forks of the Middle Fork and Buckhannon Rivers.]

Wyoming. Grass Creek Basin. Surveyed in 1912-13. 1:62,500. 44°0' - 43°45' N.; 108°45' - 108°30' W. Interval 20 ft. Edit. of July 1915.

Maps Accompanying Publications

Alaska. (a) Geologic Reconnaissance Map of the Ketchikan and Wrangell Mining Districts, Southeastern Alaska. By F. E. and C. W. Wright. 1914. 1:1,000,000. 56°31' - 54°29' N.; 134°40' - 129°48' W. 10 colors.

(b) Topographic Map of Copper Mountain and Vicinity, Alaska. Surveyed in 1908, 1914. 1:62,500. 55°17'30" - 55°10'30" N.; 132°41'0" - 132°30'30" W. 2 colors.

(c) Geologic Map and Sections of Copper Mountain and Vicinity, Alaska. By C. W. Wright. Same scale and coordinates as map (b). 7 colors.

(d) Topographic Map of Kasaan Peninsula, Prince of Wales Island, Alaska. Surveyed in 1907-1908. 1:62,500. 55°40'15" - 55°25'0" N.; 132°35'20" - 132°5'0" W. 2 colors.

(e) Geologic Map of Kasaan Peninsula, Prince of Wales Island, Alaska. Geology by C. W. Wright. Same scale and coordinates as map (d). 9 colors.

Accompany: maps (a), (b) and (c) as Pls. I, II and V respectively facing pp. 16, 28, and 30; maps (d) and (e) as Pls. XIII and XI in pocket, "Geology and Ore Deposits of Copper Mountain and Kasaan Peninsula, Alaska," by C. W. Wright, *U. S. G. S. Prof. Paper 87*, 1915.

[Map (a) is a general geological map of the southern tip of the Alaska "panhandle" reproduced from Pl. I, *U. S. G. S. Bull. 347*, 1908. Maps (b) and (d) were published respectively as Alaska Sheets No. 540B and 540A in 1911 (see under "Alaska," *Bull.*, Vol. 44, 1912, pp. 74 and 397). Maps (c) and (e), which show the geology superimposed on the topography of (b) and (d) respectively, are original, although preliminary black-and-white sketches of the two areas have appeared as Pls. III and II of *U. S. G. S. Bull. 379*, published in 1909.]

Louisiana. Sketch map of lower end of Delta of the Mississippi, showing approximately areas of land and water formed since the last detailed and complete survey was made. [1:350,000.] 29°12' - 28°54' N.; 89°28' - 88°57' W. Accompanies, as Fig. 2 on p. 14, "The Mud Lumps at the Mouths of the Mississippi," by E. W. Shaw, *U. S. G. S. Prof. Paper 85-B*, 1913.

[The importance of this sketch-map lies in the fact that it more closely approximates the present distribution of land and water at the Mississippi mouth than even the most recent Coast Survey charts. The reason for their inaccuracy is that the territory between the "passes" is not often visited and has not been surveyed for some 20 years. The map indicates that almost half of Garden Island Bay, between South and Southeast Passes, and the head of West Bay have been filled in, while Redfish and Blind Bays, respectively south and north of Southeast Pass, have been enlarged. The text (p. 13) states the gain in land to be at least 100 sq. miles, and the loss to be "many square miles." A measurement of the present map gives 50 and 9 sq. miles for the gain and loss respectively.]

Mississippi-Alabama-Georgia, etc. Map showing the Distribution of the Lithologic Divisions of the Eastern Gulf Cretaceous Deposits and Their Age Equivalencies. 1:2,500,000. 37½° - 28½° N.; 92½° - 78½° W. 14 colors. Accompanies, in pocket, as Pl. IX, "Cretaceous Deposits of the Eastern Gulf Region, etc.," by L. W. Stephenson, *U. S. G. S. Prof. Paper 81*, 1914.

New York. (a) Topographic Map of Long Island, New York. Engraved from U. S. Geological Survey topographic sheets. 1913. 1:125,000. 41°13' - 40°32' N.; 74°7' - 71°50' W. 3 colors.

(b) Geologic Map of Long Island, New York. By Myron L. Fuller. 1913. Same scale and coordinates as map (a). 22 colors.

Accompany, as Pls. II and I, "The Geology of Long Island, New York," by M. L. Fuller, *U. S. G. S. Prof. Paper 82*, 1914.

[Map (b) will immediately occupy its rightful position as the standard geological map of Long Island. The fact that it represents a natural area will add to its authoritativeness a certain quality of finality. Nineteen symbols are used to represent the principal physiographic elements of the island, as follows: Harbor Hill moraine; Ronkonkoma moraine; outwash (7 types); till of Wisconsin stage (2 types); various gravels, clays, and sands, etc. (5 types); beach deposits; dune sand; swamp and marsh deposits. Map (a) is a reduction from the 1:62,500 topographic sheets; the contour interval has been increased to 20 ft., roads are generalized to single lines and houses are omitted.

The topography of the northern shore of Long Island Sound is shown for 3 or 4 miles inland. On several copies which the reviewer has seen the relief plate unfortunately does not register accurately.]

United States. Map of the United States Showing Lines of Equal Anomaly of Gravity. [1:15,000,000.] [49°-25° N.; 25°-67° W.] Accompanies, as Pl. IV, facing p. 32, "Interpretation of Anomalies of Gravity," by G. K. Gilbert, *U. S. G. S. Prof. Paper 35-C*, 1913.

[The "contour" interval is stated to be 0.01 dyne. The map is a reduced copy of Illustration No. 2, in *U. S. Coast and Geod. Survey Spec. Publ. No. 12*.]

AFRICA.

Africa. [Nine maps of Africa], 1:45,000,000, 39° N.-35° S. and 20° W.-65° E., as follows: No. 1: The Political Map of Africa in July 1914. 7 colors. No. 2: Africa as It Might Have Been in 1916. 7 colors. No. 3: Africa As It May Be When the War Is Finished. 7 colors. No. 4: Africa and the White Man or Caucasian Sub-Species. 1 color. No. 5: Africa and the Black, Brown and Yellow Races. 3 colors. No. 6: The Future Great Railways of Africa. 2 colors. No. 7: The Mineral and Vegetable Values of Africa. 6 colors. No. 8: The Dominant Languages of Africa. 16 colors. No. 9: The Germ Diseases of Africa [affecting] Man and Beast. Accompany "The Political Geography of Africa Before and After the War," by H. H. Johnston, *Geogr. Journ.*, Vol. 45, 1915, No. 4, pp. 273-301.

[Maps Nos. 1, 2, and 3 are hardly worth printing: map 2 purports to show the ultimate partition of Africa if the European war had not broken out; map 3 is, to say the least, premature. On the other hand, the remaining maps are extremely valuable and suggestive. Map 4 shows the maximum extent of the regions which, on account of temperate climate and a sparsity or absence of indigenous population, can be colonized by the white race. Map 5 distinguishes between the distribution of (a) Caucasian races, (b) Caucasian races tinged with negritic racial intermixture, (c) negroids, and (d) negroes. Map 6 shows projected and existing railroads and water routes navigable at all seasons. On map 7 the distribution of the following 14 mineral and animal products or product groups is shown: diamonds; gold; iron; copper; tin; mineral oil, salt, coal; forest products (timber, coffee, rubber, etc.); cereals and groundnuts, sugar and tobacco; cotton; bananas, dates, grapes and other fruits; palm oil, shea butter, or other vegetable fats; pasture animals (cattle, goats, sheep, ostriches, camels and horses). Map 8 indicates the extension of the following languages: English, French, Italian, Spanish, Dutch, Portuguese, Libyan-Hamitic, Arabic, Hausa, Fula, Zulu, Swahili, Mandingo, Bangala, Congo, Tibu-Kanuri. Map 9 differentiates the area of distribution of the following diseases: (1) ulcers, boils, buboes, and similar complaints due to germ diseases; (2) "malarial" and "black water" fevers, with special symbol for "yellow fever"; (3) diseases, mainly trypanosomatic, particularly affecting cattle, horses and camels; (4) sleeping sickness of the Congo type; (5) sleeping sickness of the Rhodesian type.]

Kamerun. Die Ölpalmenbestände im Bezirk Bare. Dargestellt auf Grundlage der in der Karte von Kamerun 1:300,000 benutzten Materialien und neuer eigenen Aufnahmen von G. Adams. Gezeichnet von E. Meyer unter Leitung von M. Moisel. 1:75,000. 5°5' - 4°40' N.; 9°43.7' - 10°0.0' E. 4 colors. Accompanies, as Karte 1, *Mitt. aus den Deutschen Schutzgeb.*, Vol. 27, 1914, No. 1.

[Large-scale map of the oil-palm district on the southeastern slope of the Manenguba Mountains, a volcanic massif forming the southern end of the range separating Benue from Sanaga waters. Palm districts are shown in green, relief in approximate contours in brown, drainage in blue.]

Kamerun. Kameruner Schifffahrtsexpedition: Der Lauf des Njong zwischen Mbalmajo und Ndandumbu (km 0-244) in 2 Blatt. 1:50,000. 1 color. (1) [in two parts:] (a) Kilometer 0-Kilometer 57. (b) Kilometer 57-Kilo-

meter 145. (2) [in two parts:] (a) Kilometer 145-Kilometer 221. (b) Kilometer 221-Kilometer 244. Both sheets together: [4°0' - 3°30' N.; 11°32' - 12°43' E.]. Accompany, as Karten 3 and 4, "Die Ergebnisse der Schiffsahrtsexpedition 1913 in Kamerun," by — Hassenstein, *Mitt. aus den Deutschen Schutzgeb.*, Vol. 27, 1914, No. 2, pp. 197-206.

[Hydrographic survey of the middle section of one of the larger west-flowing rivers draining the highland of southern Kamerun. Depth and breadth are indicated at frequent intervals, and each map section is accompanied by a profile of the corresponding part of the river.]

ASIA

Caucasia. The Adai Khokh Group from the 1 verst to 1 inch Russian Surveys with corrections by Harold Raeburn. 1914. 1:125,000. 42°58.6' - 42°39.3' N.; 43°35' - 44°4' E. With inset, 1:13,000,000, showing location of main map. Accompanies "The Adai-Khokh Group, Central Caucasus," by H. Raeburn, *Geogr. Journ.*, Vol. 45, 1915, No. 3, pp. 181-202.

[Valuable map bringing out well the névé and glacier system of the massif. The map is reproduced in brown halftone; while very creditable for this process, it hardly does justice to the fine differentiation of the original drawing between glacier, bare rock, and more rounded slopes.]

Other Maps Received

NORTH AMERICA

CANADA

British Columbia. Map 109A, Prescott, Paxton and Lake Mines, Texada Island, British Columbia. 1:4800. Geological Survey, Department of Mines, [Ottawa], 1915.

Ontario. Key Harbour and its approaches, Georgian Bay, Canada. 1:12,160. Chart No. 99. Department of the Naval Service, Ottawa, March 1915.

St. Joseph Channel, Lake Huron, Canada. 1:34,468. Chart No. 88. Department of the Naval Service, Ottawa, May 1915.

Quebec. The approaches to Saguenay River, St. Lawrence River, Canada. 1:24,355. Chart No. 203. Department of the Naval Service, Ottawa, May 1915.

Saskatchewan. Map 117A, outline map, Wood Mountain Coal Area, Saskatchewan. 1:253,440. Geological Survey of Canada, Department of Mines, [Ottawa], 1915.

Saskatchewan, showing disposition of lands. 1:792,000. Railway Lands Branch, Department of the Interior, Ottawa, 1915.

UNITED STATES

Alaska. Kroll's standard map of the territory of Alaska. 1:2,534,400. Kroll Map Co., Seattle, 1914.

Map of the Bering River Coal Field, showing distribution of the various kinds of coal and location of the coal sections and coal samples described in Bulletin 335. By G. C. Martin, assisted by A. G. Maddren. 1:62,500. U. S. Geological Survey, Washington, 1915.

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